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# USSR Report

ENERGY

No. 105

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28 June 1982

# USSR REPORT

## ENERGY

No. 105

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## ELECTRIC POWER

### TASKS CONFRONTING UKRAINIAN POWER INDUSTRY DESCRIBED

Kiev ENERGETIKA I ELEKTRIFIKATSIYA in Russian No 1, Jan-Mar 82 pp 3-8

[Article by A. N. Makukhin, UkSSR minister of power and electrification: "Results of 1981 and Tasks of the Ukrainian Power Engineers"]

[Text] Struggling to realize the plans of the Communist Party, workers in the Soviet Union attained solid success in carrying out the economic and social program developed by the 26th CPSU Congress and created a reliable basis for achieving the goals of the 11th Five-Year Plan on the whole.

In his speech at the November (1981) Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, stressed: "The 11th Five-Year Plan should become--and will become--a glorious landmark on the road to the historic achievements of the Soviet people." The systematic, accelerated growth of the electric-power industry is a determining factor in the successful resolution of the chief task of the 11th Five-Year Plan--the guarantee of further improvement of the Soviet peoples' welfare based on the steady and progressive development of the national economy; the acceleration of scientific-technical progress and the transference of economic policy onto an intensive path of development; more efficient utilization of the country's production potential; the maximum conservation of all types of resources; and an improvement in the quality of labor.

Thanks to the tireless concern of the Communist Party and the Soviet government for the systematic realization of the behests of the great Lenin, electrification today has a leading role in the development of all sectors of the economy. More than 4 billion kWh of electric power are generated in the country daily, which amounts to half the annual generation called for in Lenin's GOELRO plan. The 1.2 million-kW power unit installed at the Kostromskaya GRES is equivalent to almost all the installed capacity called for in the GOELRO plan.

In 1981 the installed capacity of all electric power stations in the Soviet Union was approaching 277 million kW. The generation of electric power in the first year of the five-year plan reached 1,325 billion kWh, growing by 287 billion kWh, or 28 percent, in comparison with 1975 levels. This increase in generation alone is practically equal to the entire volume of electric power produced nationwide in 1960.

A dramatic example of the rapid pace of the electric-power industry's development in the Soviet Union is the development of power production and electrification in

the Ukraine. Guided by Lenin's instruction on electrification and struggling to carry out the socialist obligations they have assumed, the republic's power engineers and power-industry construction workers persistently work at extending the republic's power base and improving the reliability of electric-power supply to the economy and for the population's household needs.

By the end of 1981 the total installed capacity of electric-power stations in the Ukraine reached 45.2 million kW and increased by more than 18 percent in comparison with 1975.

There are in the republic 8 of 23 thermal electric-power stations possessing installed capacities of 2 million kW and more, including the Zaporozhskaya and Uglegorskaya GRES's of 3.6 million kW capacity each. The annual generation of electric power from just these two stations is practically equal to the production of all the thermal electric-power stations in the Ukraine in 1960. The technical re-equipping of the power industry is being carried out at a rapid pace through the construction of nuclear power stations. The first such station in the republic, the Chernobyl'skaya AES, is operating reliably. With the commissioning of the third power unit in 1981, the station's output reached 3 million kW. In the period 1977-1981 the station has already generated more than 46 billion kWh of electric power, which has made it possible to save the economy 23 million tons of coal. The equipment is being successfully mastered at the Rovenskaya AES, where a second power unit with an output of 440,000 kW was commissioned at the end of last year.

In accordance with the resolutions of the 26th CPSU Congress, the Southern Ukraine, Zaporozhskaya, Khmel'nitskaya and Crimean AES's are under construction in the republic, and work has begun on the construction of the Odessa atomic TETs.

A glorious labor victory was achieved last year by the builders and operators of the Dnestrovskaya GES who insured the commissioning of the first two hydraulic units with outputs of 117,000 kW each.

Aggressive exploration is underway in the Ukraine in an effort to develop new energy sources. Construction has already begun in the Crimea on an experimental 5,000-kW solar electric-power station, while engineers are designing a solar electric-power station with an output of up to 300,000 kW. Plans are being made to construct a 1 million-kW geothermal electric-power station in the Transcarpathians.

A great deal of attention in the republic is being devoted to the development of electric-power networks. Within the UkSSR Ministry of Power and Electrification alone the total extent of electric-power networks today exceeds 830,000 km. A 750-kV transmission line operates steadily from the Donets Basin to the western border and farther on to Al'bertirsha (Hungary). The commissioning of this line increased the reliability of electric-power supply to the western regions of the Ukraine and made it possible to bring the USSR Unified Power System and the integrated power systems of the CEMA member-nations into parallel operation.

The republic has achieved solid success in the area of agricultural electrification. As early as the beginning of the current five-year plan, large-scale livestock complexes and poultry farms were provided with a second source of electric power. Last year work was begun on equipping all dairy farms with dual power supplies. Measures taken to improve the reliability of the electric-power supply to agriculture have

made it possible to reduce power outages at kolkhozes and sovkhoses in comparison with 1980.

In 1981 the generation of electric power in the Ukraine amounted to more than 231 billion kWh. This exceeds 1975 levels by a factor of 1.2.

In comparison with the previous year, the utilization factor of installed capacity of the most economical group of 800,000-kW power units rose from 66.2 percent to 71.6 percent. The primary indicator of the industry's economic efficiency--the per-unit expenditure of conventional fuel for the generation of electric power--was reduced by 1.3 g per kWh. This made it possible to free 227,000 t of conventional fuel.

Work continued in power-industry production associations on improving control apparatus and reducing its cost. Since 1 January 1981, 114 shops and sections and 8 structural subdivisions have been integrated. This has made it possible to free more than 1,000 pieces of control apparatus and reduce expenditures for their maintenance by 4.4 million rubles.

As a result of the planned organizational and technical measures that have been carried out at operational electric-power stations, 1,600 production personnel were freed in 1981, including 1,000 personnel who were freed as a result of improvements in the technical level of production. A total of 1,300 workers made the transition from manual to mechanized labor, exceeding the planned figure of 1,200.

Serious attention was devoted to the issue of living conditions and cultural development of collectives within power-industry enterprises and to the creation of favorable work and recreational conditions for the laborers. Housing with an area of 131,000 m<sup>2</sup> (103.2 percent of the plan) was built for power-industry workers over the year.

Taking an active part in the socialist competition to achieve early fulfillment of the resolutions of the 26th CPSU Congress and the 26th Congress of the Ukrainian Communist Party, collectives of the enterprises within the republic's power industry were basically successful in dealing with the socialist obligations they had assumed. In 1981 a number of these collectives were awarded places in all-union and republic competition. These included collectives from the Zaporozhskaya, Kurakhovskaya, Slavyanskaya and Tripol'skaya GRES's, the Kiev TETs-5, Dneproenergozemont, the Ternopol'skiy regional electric-power system enterprise and others.

The successes achieved are a result of the selfless labor of tens of thousands of the republic's power workers and power-industry builders as well as a result of the tireless concern over the development of electrification expressed by the CPSU Central Committee, the Central Committee of the Ukrainian Communist Party, the USSR Council of Ministers, the republic's government and the USSR Ministry of Power and Electrification.

The improved organization of socialist competition and the dissemination of progressive industrial experience played an important role in the campaign to carry out the state plan and the socialist obligations they had assumed.



Competition for a communist attitude toward work acquired a massive character at power-industry enterprises in the republic. The high title of "Shock Worker of Communist Labor" has at the present time been earned by about 95,000 leading workers in the industry, while 29 enterprises, 583 shops and 5,100 sections, shifts and teams earned the title "Collective of Communist Labor."

Among the leaders of socialist competition in the past year were: A. I. Kirshenin, power-unit operator at the Kiev TETs-5 and delegate to the 26th Congress of the Ukrainian Communist Party; V. K. Mishchenko, senior machine operator in the boiler and turbine shop of the Zmiyevskaya GRES; V. P. Osadchiy, welder at the Krivorozhskaya GRES; A. G. Belotserkovskiy, boiler operator at the Uglegorskaya GRES, and many others.

The labor of the power workers and power-industry builders is rated highly by the Communist Party and the Soviet government. In the years 1976-1981, over 2 million power workers and leaders of industry in the USSR Ministry of Power and Electrification alone were awarded the state orders of the Soviet Union and the UkSSR for high work indicators.

The results of work within the industry in the first year of the five-year plan were examined at an enlarged session of the board of the UkSSR Ministry of Power and Electrification.

An analysis of the production economic activity of the republic's power-industry associations was carried out in light of the demands made by the 26th CPSU Congress and the aims put forth by Comrade L. I. Brezhnev in his November (1981) speech to the Plenum of the CPSU Central Committee. It showed that, together with overall positive results in the operations of individual power-industry enterprises, shortages and nonutilization of resources were still occurring. In his report to the November (1981) Plenum of the Central Committee of the Ukrainian Communist Party, member of the Political Bureau of the CPSU Central Committee and first secretary of the Central Committee of the Ukrainian Communist Party Comrade V. V. Shcherbitskiy directed the ministry's attention to a number of these enterprises, and with good reason.

There have been, for example, emergency and forced shut-downs of power units, particularly at electric-power stations burning low-grade fuel. There have been cases of low-quality repair work, and this has led to repair work being done a second time as well as to power shortages on repaired equipment. Not all avenues for conserving fuel were fully utilized, as a result of which 152,000 t of conventional fuel were overexpended when compared to the lowest per-unit rate of consumption.

Because of a shortfall in the delivery of lumber required for power-industry needs (comprising only 36 percent of apportioned funds), the plan of power-system construction for agricultural purposes was not fully carried out.

The board planned measures to eliminate existing shortcomings in the activities of power-industry enterprises and approved basic organizational and engineering measures, the realization of which will make it possible to utilize internal resources more fully and insure fulfillment of the state plan and the socialist obligations of the republic's power engineers for 1982.

The success achieved by the party and the people in the first year of the five-year plan and the new tasks established by the November (1981) Plenum of the CPSU Central Committee and the sixth session of the USSR Supreme Soviet brought about a tremendous creative uplift among the Soviet people and a new rise in their efforts and energies. The State Plan for the Economic and Social Development of the USSR in 1981-1985, approved by the Plenum of the CPSU Central Committee and accepted by a session of the USSR Supreme Soviet, is directed at further increasing economic potential, improving the economy's efficiency, raising the standard of living and strengthening the country's defense capability.

The economy of the Ukraine will be further developed within the USSR's unified economic complex. The five-year plan provides for increasing industrial output by 23 percent and the average annual gross agricultural product by 12 percent. Over the course of the five-year plan, real per capita income in the republic will increase by 17 percent. Approximately 81 million m<sup>2</sup> of living space will be built. This will make it possible to improve housing conditions for 7 million people.

A rapid rate of development is planned for the republic's fuel and power complex, including the electric-power industry. In 1985, the production of electric power in the Ukraine will increase to 279 billion kWh, or 18.2 percent when compared with 1980 levels. In this case, practically the entire increase in production will be obtained through nuclear power plants, the generation of power from which will increase from 14 to 78 billion kWh, or a factor of 5.5. The utilization of nuclear power plants will make it possible to free more than 100 million t of coal for the economy during the 11th Five-Year Plan.

In order to generate this, the five-year plan provides for increasing the introduction of new power-generating equipment in the republic by more than a factor of 1.5 in comparison with the 10th Five-Year Plan. Plans have been made to commission power units at the Chernobyl'skaya, Rovenskaya, Southern Ukraine, Zaporozhskaya and Khmel'nitskaya AES's, at the Zuyevskaya GRES-2, the Kiev TETs-6 and at a number of other electric-power stations. The Dnestrovskaya GRES will be brought up to full design power--700,000 kW.

In an effort to increase the reliability of the electric-power supply to the economy and municipal consumers, plans have been made to construct 118,700 km of electric-power transmission lines of all voltages, including a number of 750-kv trunklines to deliver power from AES's. In order to improve the electric-power supply to agriculture, we have set a task to complete the equipping of all dairy farms with dual power-supplies by the end of 1983.

Together with the increase in production capacities, serious attention will be devoted to strengthening environmental protection. At a number of electric-power stations, plans are being made to introduce waste-water purification systems, equipment to trap and neutralize harmful substances in exhaust gases and devices designed to remove dry ash and utilize the ash wastes.

The distribution of thermal power to the republic's hothouse combines will increase considerably during the current five-year plan. This will make it possible to increase the yield of vegetables per square meter of hothouse space and reduce the cost of these vegetables. Commercial fish breeding will be expanded, using the heated discharge water from electric power stations. All of this will be a worthy labor contribution on the part of power engineers in carrying out the republic's food program.

The Ukraine's power base will be considerably expanded in the second year of the five-year plan. A total of 2.14 million kW of new capacities will be commissioned, including the first 1 million-kW power unit at the South Ukraine AES, the second 300,000-kW unit at the Zuyevskaya GRES-2, two 117,000-kW hydraulic generators at the Dnestrovskaya GES and a number of other pieces of generating equipment. Plans have been made to build about 24,000 km of electric-power transmission lines, including 22,000 km of lines to provide electric-power to agriculture.

In order to further improve the power workers' living conditions, 150,000 m<sup>2</sup> of living quarters, 5 kindergartens, a 120-bed hospital and a number of other social, cultural and welfare installations will be built this year.

The generation of electric power in 1982 should amount to 240.6 billion kWh, a 4-percent increase. This will include 27 billion kWh generated by AES's, an increase by a factor of 1.7.

In order to improve the industry's operating efficiency and increase the reliability and economy of equipment, a system of measures is planned for 1982 to modernize heating surfaces and turbines, to replace bends in nonheated boiler-pipe units, to prevent damage to coal-pulverizing mills and hydraulic clutches in feed pumps for 300,000-kW units, to dismantle obsolete, uneconomical equipment, etc.

This year, power workers have been presented with the critical task of reducing the expenditure of fuel for the production of electric power. The per-unit fuel expenditure for each kWh produced must be brought down to 342.9; that is, reduced by 1.9 g in comparison to 1981 levels. This will make it possible to conserve more than 500,000 t of coal.

Serious work remains to be done with regard to further increasing the rate of technical progress, carrying out measures to introduce new technology, preventing accidents and improving industrial hygiene. Supervisory agencies in the power industry must increase considerably their day-to-day control over the work of power consumers and over the way they observe prescribed regimes for the consumption of electric power.

The successful resolution of all these tasks and the systematic execution of the socioeconomic program established by the 26th CPSU Congress require, first of all, a general improvement in the work with personnel, a guarantee of further increases in the levels of organizational, ideological and political-educational work and constant improvement in management style and methods. Work must be continued at all levels to strengthen control, to increase monitoring of performance and to reinforce executive and state discipline.

Guided by the directions and instructions presented in the speech of comrade L. I. Brezhnev at the November (1981) Plenum of the CPSU Central Committee, we must concentrate attention on the practical solution to tasks involving improving the efficiency of power production. As Comrade V. V. Shcherbitskiy pointed out at the November (1981) Plenum of the Central Committee of the Ukrainian Communist Party: "Of paramount importance in our daily practical activity must be this requirement formulated by L. I. Brezhnev in his speech at the Plenum: to work better, exhibit more initiative, increase discipline and efficiency in all sectors and to think not only of the current plan, but of the five-year plan as a whole."

In all collectives it is necessary to insure strict control over progress in carrying out organizational and engineering measures as well as socialist obligations assumed for 1982.

According to the example of the collective at the Tripol'skaya GRES, we must everywhere organize the development of massive socialist competition, insure improvement of its publicity, provide for broad dissemination of progressive industrial experience and guarantee timely help for those who lag behind. We must actively utilize the political and labor lift caused by the resolutions of the November (1981) Plenums of the CPSU and Ukrainian Communist Party Central Committees and by preparations for the 60th anniversary of the formation of the USSR to strengthen the patriotic and international education of the workers and to further reinforce the fraternal friendship of the peoples of our great motherland.

Recognizing the leading role of the electric-power industry in the practical execution of tasks of the five-year plan as well as the responsibility for providing a reliable power supply to consumers, the Ukrainian power engineers adopt all measures to insure the unconditional fulfillment of the state plan and socialist obligations for 1982.

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## ELECTRIC POWER

### EXPLOSION, FIRE AT VOLZHSKAYA GES

Moscow SOVETSKAYA ROSSIYA in Russian 3 Apr 82 p 4

/Article by S. Kremnev, Volgograd: "How the Fire at the Volzhskaya GES Was Conquered: While the City Slept"/

/Text/ The telephone call woke the chief of the fire department of the Administration of Internal Affairs of the Volgograd Oblast Executive Committee, Colonel B. V. Denisov, in the middle of the night. The duty officer reported that at the Volzhskaya GES imeni 22nd Party Congress the assistance of the subelement's specialists was needed. The fire chief summoned a car and called the home of one the most reliable specialists, Lt. Col. I. Ya. Zhuravlev, alerting him to the fact that he was coming by for him right away.

0346 hours. At the communications center the signal came in announcing that the automatic fire alarm at the direct current substation had sounded. At the central control panel of the GES the fire alarm also sounded and a siren went off. Following this a loud explosion was heard. Three minutes later the electricians informed the shift chief about the emergency near the third and fourth sections of the direct current substation.

From the explanatory note of the duty officer for the guarding of the administration, A. P. Shinkarev: "When the signal was heard, the shift chief, V. V. Ushakov, came running into my office and said that smoke had been detected in the fourth section of the direct current substation. Together we went to see what had happened. It was impossible to determine anything by this time. I ran to the telephone in the corridor to make a call, but there was an explosion followed by a flame."

0350 hours. The duty officer reported the fire to the military fire unit No 11. Following this the circuitry was disconnected and the power station was isolated from the affected sections.

From the note: "The cause of the fire - a capacitive element was damaged, which resulted in a short circuit arc in the sealed condenser, which was filled with oil. As a result pressure within the element built up and there was an explosion. The oil that leaked out of the transformer elements was ignited by the arc then began to spread

throughout the facility. Fragments of the porcelain casings, which scattered with great force from the explosion, damaged the oil-filled condensers. This resulted in the release of more oil and increased the area of combustion.

The chief engineer of the hydroelectric power station, E. S. Kul'gusskiy: "The power station director and I went immediately to the site of the fire. Damage at the direct current substation could cause an entire chain of accidents. Not only were some of the generators threatened with shut-down, but other equipment as well."

0410 hours. The facility of the third and fourth sections of the direct current substation was completely filled with smoke. There was no visibility. The fire was accompanied by high temperature. There was the threat that the fire might spread into the cable half-story, the cable corridor and other facilities of the substation.

0430 hours. Subelements of fire stations from the Volzhskiy Rayon and several other rayons of Volgograd were summoned - more than ten fire trucks and special vehicles. All activities were guided by the headquarters that had been established at the fire. Quickly getting their bearings, five gas and smoke fighting elements were formed to work in the danger zone using oxygen devices. In addition, four emergency sectors were created, each of which had its own specific task. The first such sector was the stairwell near generator No 7 - the most dangerous place. I. Ya. Zhuravlev was in charge of this work. He was put in charge of two fire fighting units and all of the gas and smoke fighting elements. The second sector included the stairwell near generator No 5. Work in this sector was overseen by V. S. Danilov. The third and fourth sectors were the cable half-story and the stairwell near generator No 9; these sectors were under the supervision of N. V. Latkin and A. A. Strekayev, respectively.

B. V. Denisov: "First of all we needed to attempt to switch on the emergency fire extinguishing systems available at the substation. I gave I. Ya. Zhuravlev the authority to choose volunteers and then to go down into the facility and turn this system on. This was dangerous work."

I. Ya. Zhuravlev: "I assembled the personnel and asked volunteers to step forward. The first to step out were Senior Lieutenant V. V. Yegorov and Senior Sergeant N. A. Tikhonov. In the formation I noticed a rather young sergeant. His chin was trembling. I took his oxygen mask from him and then went over all of the details with the director of the hydroelectric power station, V. Ya. Masol'd, and the chief engineer, E. S. Kul'gusskiy. From memory they sketched the layout on the wall. And then I went to work."

The first element groped its way down along the steep, smoke-filled stairs into the basement of the power station. They proceeded in total

darkness. The powerful flashlights did not even penetrate 10 centimeters of the smoke. Ordinary radio communications did not work - so great is the electrical field generated by the power station. The element had to carry a spool of telephone wire.

0513 hours. With each minute the situation became more complicated. The damage to the condensers led to an additional release of oil and the further spread of the fire. The high temperature of the rising current of air caused the connections of the alternating current circuits to be destroyed. Because they were in the zone of the high temperature, the air supply pipes lost their hermetic seal.

"Give me a situation report," shouted B. V. Denisov into the telephone. "Can you make anything at all out?"

"There is no visibility," answered Lt. Col I. Ya. Zhuravlev. "We are continuing to descend."

The element had to descend to the 13 meter mark. Finally they reached their destination. But the smoke was just as thick in the basement as it was above. The three brave men covered the basement with great difficulty turning off valves wherever they encountered them. Each time they learned from above that the fire extinguishing system still was not on. They returned ten minutes later having fulfilled only one task: they shut off the oil lines. But this was an important victory.

0525 hours. A new element of gas and smoke fighters and Lt. Col. I. Ya. Zhuravlev again entered the fire and smoke with the task of finding the locations of fire and putting them out. In several minutes they found a fire in the facility near the third generator.

0530 hours. The fire fighting headquarters received word of the sharp rise in temperature in the cable half-story and the cable channels. Within the power station itself the crane girder was deformed from the heat. The protective layer of reinforced concrete covers began to fly off and the rubber lining of the temperature seams caught fire. The fire crept to the power cables, the nerves of the power station. If they malfunctioned, the power station would shut down.

0551 hours. The fire fighting headquarters issued orders to put two hoses with a water stream of nine atmospheres from the side of generators No 5 and No 7 with the task: organize the protection of the units and equipment and to prevent the fire from spreading further.

Senior Lieutenant V. N. Aleksandrin, having received this command, fearlessly rushed to fight the fire. He was one of the first to skillfully man the water hose. He quickly assembled his subordinates and successfully handled his assigned task. Not far behind him were Senior Lieutenant V. V. Yegorov and Senior Sergeant N. A. Tikhonov, who fought the fire in the cable half-story.

Lt. Col. I. Ya. Zhuravlev had a more difficult time than anyone else. Seven times he went down into the fire, changing elements every 15 minutes. Seven times - and each time with a risk to his life. These were the most difficult hours.

0728 hours. The fire was localized.

0827 hours. The fire was completely extinguished.

They returned home only after 24 hours. It was again night. Television broadcasts were over and the lights in the houses were out; the city was at rest. Wearily Zhuravlev went up the stairs, approached the door to his apartment and rang the doorbell: he had to wake up his family. But no problem. They know all about the work of the firemen.

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## ELECTRIC POWER

### ZAGORSK GAES CONSTRUCTION REPORT

Moscow PRAVDA in Russian 4 April 82 p 2

/Article by N. Petrov, Special Correspondent for the newspaper PRAVDA, Zagorsk, Moscow Oblast: "The First, the Zagorskaya"/

/Text/ "To undertake the construction of water storage electric power stations in the European section of the USSR." (From the Basic Directions for the Economic and Social Development of the USSR)

Only five years ago the road between Zagorsk and Uglich was quiet and deserted. The infrequent "Zhiguli" automobile with mushroom hunters hurried from hill to hill between the sparse settlements. Things are different now: at any time of the day or night it is no easy matter to pass the numerous dumptrucks and heavy trucks. It is quite clear that a large construction project is at hand. To put it more precisely, this is one of the largest energy construction undertakings in the European section of the Soviet Union. Several kilometers from Zagorsk they are building a 1.2 million kW hydroelectric power station. For comparison, in capacity this will equal two pre-war Dnepr River hydroelectric power stations.

The Dnepr is a large river; it would seem that it was destined to become a major source of energy. And where is electricity to be gotten here - certainly not from the small Kun'ya River, which in the summer is no higher than a sparrow's ankle?

In the final analysis, it is the Kun'ya River, on the shores of which the Zagorskaya power station is being built. It is to be an unusual power station - a water storage electric power station - a GAES. Let us remember this combination of words - you will encounter it in the press more and more, as you will on the radio and television. For the Soviet Union needs many GAES's and other such power stations will be going up. But the Zagorskaya is the first, if you discount a comparatively small, experimental GAES that was built several years ago on the Dnepr River.

Thus, the GAES is, at first glance, a strange structure, even somewhat "illogical". Imagine two enormous reservoirs, two artificial lakes: one elevated or on a mountain and the second lower in the Kun'ya valley. The lakes are connected by six lines of gigantic water conduits, in the lower portion of which is the GAES building within which are the powerful, 200,000 kW each hydrounits. Once a day on a signal from the control panel the gates are opened and water rushes, under a great deal of pressure, from the upper reservoir into the lower. Within minutes, the turbines pick up speed and electric power is fed into the power system.

But in just four hours the upper basin is almost completely empty; twenty million cubic meters of water have done their job, having generated four to five million kilowatt-hours of electricity for the power system. The turbines shut down and are quiet. But not for long. Soon they will come to life again. Only now they will turn in the opposite direction, becoming pumps to feed water from the lower basin into the upper. Six to seven hours of intensive work and the water in the upper reservoir rises to nearly 10 meters. Then the cycle repeats itself all over: the gates open, the flow of water falls upon the blades of the turbines, and electric power rushes along the lines to the cities and plants.

In general terms, this is the operating principle of any GAES, including the Zagorskaya GAES. But for what reason do we constantly transfer water from the upper basin into the lower and then pump it back again?

There is a good reason for this. The problem is that the overwhelming majority - more than 90 percent - of electric power is generated at thermal and atomic electric power stations. Moreover, since the hydroresources of our European rivers will soon be exhausted, this percentage will continue to increase. TETs and GRES units are powerful, reliable and productive, but all have the same shortcoming: a great deal of time is required to start them and to shut them down - from several hours to several days. It is even more complicated to start and stop the atomic 1,000,000 kW electric power stations. Also, the consumption of energy within a twenty-four hour period varies greatly - sometimes by as much as 1.5 to 2-fold. And it turns out: during the course of any period of time there is a shortage of electricity or there is too much.

Of course, one could build new GRES's and AES's to cover the peak hours and create very complicated and expensive devices for monitoring the supply of electric power to the power system. But one can also build power stations that are capable of rapidly starting up their turbines and providing additional power just when it is most needed - during the morning and evening peak hours. These same power stations can use some of the excess electricity during the quiet hours to again fill the water-storage reservoirs. This is exactly how the Zagorskaya GAES will operate.

Someone who has visited only once in his life the construction site of a large hydroelectric power station, be it on the Volga, Angara, or Yenisey rivers, would not instantly notice the difference at Zagorsk. There is the same collection of equipment: powerful step excavators, many scrapers, bulldozers and dumptrucks. There is the same deep foundation trench, a large concrete plant, and massive reinforced concrete structures. Everything is like it is everywhere. But not quite the same. For example, there is no enormous dam such as can be found at any GES. Even though the power station is an hydraulic plant, here the water is used differently than at regular hydroelectric power stations.

The chief of the Zagorskaya GAES construction project, L. Tolkachev, says, "It was not easy to select a site for our power station. It was crucial that the drop in height between the upper and lower reservoirs be sufficient. Here it is equal to approximately 100 meters."

The "UAZik" did not have much difficulty going up the mountain. Although the incline is high, it is gently sloping. The broad field, dotted with small clusters of trees, a small village with a pointed steeple church on a knoll. For now it is still difficult to see in this landscape the bed of the future expansive reservoir - an entire sea with 30 million cubic meters of water. Excavators and scrapers are at work everywhere. Work on the powerful earthen dam, which will surround the reservoir, has gotten underway; in different places the height of the dam will be from 12 to 40 meters.

From above one can easily see how the work is proceeding below. Quite a bit has already been done. Some of the powerful units have already been poured in concrete; these units will form the foundation of the power station's building. The installation of the pipelines will get underway in the summer. And by the end of next year the power station is to produce the first current.

It happened that Tolkachev and I had met previously at the site of the construction of the Toktogul'skaya GES in the Kirghiz SSR, where he was working as the chief engineer. I recall the extremely difficult conditions in which the Toktogul'skaya GES was being built - in a confined mountain ravine on a tiny spot where the builders had nowhere to get their work underway. To this add the winding, mountain roads and frequent, but not strong earthquakes. I ask Leonid Azer'yavich which of these locations, the Toktogul River or the Kun'ya River, was the most difficult?

"Of course, it is the Kun'ya River. The cliffs represent a reliable and specific material, although they are somewhat difficult. But here there are the quicksands which creep and the underground springs and streams. The Zagorsk earth has produced and continues to produce quite a few surprises."

For example, it will not be easy to build the powerful water-pipes. First, it will be necessary to make them in steel. The designers and

builders have found the opportunity of using a new material - steel reinforced concrete. A special experimental plant is being created, which will be the first of its kind in the Soviet Union to put the production of four-meter sections of these pipes on a flow-line production basis.

The reservoir, in which the water level will change sharply, will cause a lot of problems. Twice a day the water level will rise and fall by ten meters. It is clear that the shorelines must be firmly fortified and that methods for monitoring the fortifications and the drainage system must be carefully thought out.

"Is there any confidence that the young collective is capable of solving all of these tasks?"

"Of course! After all, the backbone of the collective is made up of several hundreds of the most experienced hydroelectric power station builders, who have come here from the Angara, Yenisey, Naryn and Vaksha, and the Dnepr and Volga. Many of them were attracted to this project by the novelty of its engineering and technical solutions and the importance of the unusual project."

At some distance from the GAES, a settlement for the hydroelectric power station builders is being built, consisting of 9-story apartment buildings. According to K. Aleksandrov, the deputy chief of the construction project for services and personnel, nearly 2,000 men have already received permanent apartments. Two kindergartens are already in operation and a third will soon be ready.

We have already said that the Zagorskaya GAES is the first of several such power stations. But one other GAES is already under construction in the Lithuanian SSR - the Kayshyadorskaya GAES. This GAES will have the same drop in height - 100 meters. And they will use the exact same assemblies and water lines - there will be more of them here than in Zagorsk. The building and dam will be similar in design to those in Zagorsk. Four more GAES's will be built in the current five-year plan. At new sites in principle it will be possible to build similar primary and auxiliary facilities. All of this will substantially simplify and reduce the cost of building GAES's.

"The need for water storage electric power stations is great," said the deputy chief of department of the Gidroproyekt Institute imeni S. Ya. Zhuk, S. Berezinskiy. "A standard design for GAES's will make it possible to construct them on a flow-line production basis and to build them relatively quickly and inexpensively."

These are good plans. And it is important that the established work schedule be observed in Zagorsk and at all construction projects. But this is not always achieved. The construction project does not have enough skilled workers.

This question is of some concern. In Zagorsk they must come up with methods for the flow-line construction of GAES's, for the most rational technology and organization of labor, recommendations for the other collectives which are to build the same kind of power stations. As of now no one is engaged in this. Several subcontractors - subelements of the specialized trusts "Gidromontazh and "Spetsgidroenergmontazh" - have permitted significant lags in their work.

The cities and plants of the European center of the Soviet Union are awaiting the power of the Zagorskaya GAES. It is possible and necessary to build it as quickly as possible.

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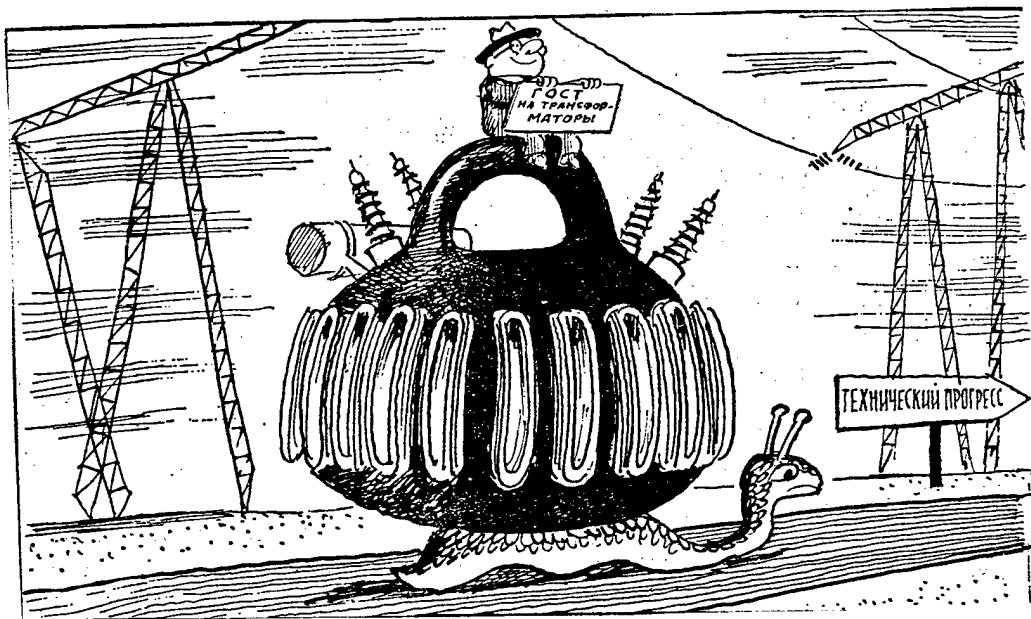
## ELECTRIC POWER

### CRITICISM AIMED AT MINISTRY OF ELECTRICAL EQUIPMENT

Moscow PRAVDA in Russian 1 Apr 82 p 3

/Cartoon by Yu. Cherepanov/

/Text/ Many enterprises and organizations of the Soyuz-transformator Association of the USSR Ministry of the Electrical Equipment Industry are putting out product that does not meet modern requirements. For the production of heavy transformers more than 30,000 tons of rolled metal are overexpended each year. Additional losses of electricity amount to more than 2 billion kilowatt-hours per year. (From materials of organs of the peoples' control)



"Our transformer technology does not stand still either."  
Key: 1) State standard (GOST) for transformers; 2) Technical progress.

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## ELECTRIC POWER

### FIRE PREVENTION SHORTCOMINGS AT ELECTRIC POWER STATIONS

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 1 Apr 82 p 4

/Article by R. Nurseitov, chief of the department of the State Fire Inspection Administration of the Kazakh SSR Ministry of Internal Affairs: "Order - a Barrier to Fire: Problems of Fire Prevention at Power Industry Facilities"

/Text/ At electric power stations, which are the heart of industry's supply of electricity, the development of power units that are safe from a fire point of view and protective means and measures, which prevent fires from happening, are of utmost importance. In connection with this, new standards have been created and the existing standards are being reexamined. A great deal of attention is being given to the problem of safety equipment for fighting fires at these key facilities.

There are several ways to reduce the threat of fire. This includes the selection and rating of electrical shielding, the appropriate execution and placement of the power units themselves, the use of fireproof coverings, and the adoption of effective alarm systems and firefighting methods.

It is necessary to discuss this because fire prevention requirements are still being violated during the designing, installation and operation of power units. For example, a great deal of the designing work in the Kazakh SSR for the construction of new and the modernization and expansion of existing electric power stations is done by the Central Asian Department of the VNIPIenergoprom Institute /All-Union Scientific-Research and Design Institute of the Power Industry/. In the designs that they do there are frequent digressions from the existing fire prevention requirements.

There are serious violations of norms in the designs for the construction of the Ekibastuzskaya GRES, which were done by the Novosibirsk branch of the Teploelektroproyekt VGPI /thermal electric power station designing branch of the All-Union State Design Institute/; there are also serious problems in the design for the construction of the Southern Kazakhstanskaya GRES, which was done by the same organization.

In several cases the designers stipulate the use of construction materials that are inexpensive, but which from a fire point of view are more dangerous. Errors are committed in the estimates for the distance of evacuation routes and in determining the amount of water required for extinguishing a fire. Provision is not always made for the installation of automatic units for detecting and extinguishing fires.

This is essentially the consequence of the poor organization of technical training of specialists and delays in informing them of changes and additions to the existing norms. Of course, there are also instances of an irresponsible attitude of the specialists toward the work that they are doing and of poor management over the quality of designs.

Of considerable importance is how the fire prevention regime is observed at the facilities. In this regard the Dzhambulskaya GRES can serve as an example. But sometimes one can see facilities where the surrounding territory and facilities are cluttered with trash, where the equipment has malfunctioned, and where labor discipline is poor. It is easy to understand that it is at such facilities where most often fires occur.

There have been quite a few violations of fire prevention practices at the construction site of the Ekibastuzskaya GRES (the general contractor is the Ekibastuzenergostroy Trust /Ekibastuz electric power station construction trust/). It is no accident that in 1981 alone there were several fires at these power stations; one of the fires cost the state 60,000 rubles. All the same the needed regime is being maintained at a low level.

Frequently there are a large number of omissions and unfinished work on fire prevention features at power facilities that have been submitted for handover to the customer. Often this can be explained by the fact that the builders, in beginning to erect a facility according to an incomplete design, do not have an opportunity to order the needed materials and equipment on a timely basis. Thus even at the moment of construction a significant flaw is built into the facility, which forces them at a later time to take additional measures on the fire prevention aspects.

It is these kinds of shortcomings that are evident in the Tentekskaya TETs in Karagandinskaya Oblast, where several facilities and the fuel oil storage site were not equipped with automatic fire extinguishing systems.

Of course, the problem here was not just in the omissions of the designers and builders, but in the fact that the TETs administration was not duly concerned about fire prevention and accepted serious shortcomings.



Fire prevention consists of several elements. Importance is attached to the creation of the most favorable conditions for the workers of this crucial service. However, the necessary concern is not always shown for the people and their working conditions. For example, the administration of the Karagadinskaya GRES-2 and TETs-3 is not meeting the contract obligations to provide the fire department with technical means and spare parts for the fire fighting trucks, equipment, furniture and other inventory for the buildings of the fire stations. The administration is not providing the workers with housing, space in the childrens' institutions, and other benefits on a level equal to those available to the workers at the power stations.

At other power facilities problems having to do with the repair and maintenance of automatic fire extinguishing systems and alarm systems have not been resolved. In some cases the enterprises do not have direct telephone communications with their fire fighting subelements.

In improving all of these concerns an important role is played by the fire-technical commissions, which are called upon to conduct regular inspections of the shops, sectors and facilities on the whole, to compile plans for the implementation of their recommendations, and to ensure that they are carried out. However, it must be admitted that at many facilities such commissions exist only on paper and are engaged in this type of work very little.

The same can be said of the volunteer fire fighting organizations. At some power enterprises the volunteers are forgotten and no provisions are made to involve them in the regular training programs designed to raise the level of their readiness.

In protecting socialist property the fire fighting service plays a central role. But it will not be able to carry out its role to the fullest extent if the managers of the enterprises and construction and design organizations fail to attach equal importance to the condition of the fire prevention safety programs. Without this joint responsibility it is difficult to achieve good results.

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## ELECTRIC POWER

### BRIEFS

GUR'YEV FUEL CONSERVATION--To further reduce the expenditure of conventional fuel per kilowatt-hour - such is the goal of the Gur'yev power workers, who also supply power to the Mangyshlak Oblast. They base their efforts on actual possibilities - last year they managed to reduce this figure by more than one gram. The Embinskoye electric networks enterprise's workers and specialists did an especially outstanding job in this. They exceeded by some 200,000 kW-hours the plan for transferring power while simultaneously managing to conserve more than 350,000 kW-hours. Having exchanged their experience, the Gur'yev power workers decided to concentrate their efforts on eliminating violations in the work mode at their enterprises and to reduce losses in the electric networks. Steps are being taken to put the heating surfaces of the boiler units in better condition. At the same time they have filed claims against the supply and construction organizations responsible for shortages of wooden and reinforced concrete supports, attachments and spare parts for the electrical equipment and motor transport. This can be seen in the generation of electricity. It hinders the prevention of accidents and, in the final analysis, makes it difficult to struggle for efficiency and thrift in the power supply system. The elimination of omissions in this regard is especially important now when we are to hand over high-voltage electric power transmission lines between Gur'yev and Inder and Gur'yev and Kul'sary and new transformer capacities for hundreds of thousands of kilowatt-amperes. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 10 Feb 82 p 17 8927

POWER LINES FROM ZEYSKAYA GES--The first support foundations have been put in place on the LEP-500 route from the Zeyskaya GES to Khabarovsk. The "500" - the first in Khabarovsk Kray - has been declared a key national construction project. It is to be put into operation in December of this year - significantly ahead of schedule. The economy of the Far East is developing rapidly. The requirement for electricity increases by 10 percent each year. The thermal electric power stations of the region are operating at maximum levels. At the same time the capacities of the Zeyskaya GES are being used at only 60 percent. In order to ensure that the first Far Eastern GES can meet the shortages of electricity in Amur Oblast and Khabarovsk Kray, as planned, it has been necessary to build a 954 km stretch of a LEP-500. However,

at the start of this year only 356 kilometers of this line -- from the GES to the Amurskaya substation in Svobodnoye -- are in operation. The laying of another 200 kilometers of the route is now being completed. The remaining 400 kilometers -- from the Bureya River to Khabarovsk -- are to be built in 1982. To solve this task, the kray builders intend to mobilize all of their experience gained during the speeded-up construction of the LEP-220 between Khabarovsk and Komsomol'sk-na-Amure. Mechanized detachments are being deployed to work on the "500"; these detachments were formed in the cities and rayons of the kray. The construction industry enterprises have started to fulfill the orders for the construction project. The LEP-500 will not only provide Khabarovsk Kray with a powerful flow of energy from the Zeyskaya GES and the Raychikhinskaya GRES. In the future it will connect the central Amur River area with the Neryugrinskaya GRES. It will accept the power of the Bureyskaya GES, which is now under construction and will be twice as powerful as its Zeyskaya "sister". And then from the Amurskaya Oblast electric power will be transmitted to Komsomol'sk-na-Amure along the Trans Siberian railroad and the completed BAM. Then the enormous power circle will be closed -- the basis for the progress of the Far East. [By O. Kvyatkovskiy] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 5 Mar 82 p 2] 8927

KATEK POWER STATIONS--At the giant mines of the Kansk-Achinsk coal basin in Krasnoyarsk Kray, a fuel and power complex (KATEK) is being created on an unprecedented scale. The electric power stations of this giant will be built not only according to regular designs for thermal electric power plants. The coal will not just be burned in the boiler furnaces; it will be subjected to comprehensive reprocessing, producing both electricity and coal oil and other products. The installation of the first industrial plant for high-speed pyrolysis of coal is now being completed at the Krasnoyarskaya TETs-2. Within one hour it will be able to process 175 tons of coal. The large GRES's (with a rated capacity of 6,400,000 kW), which will appear within the KATEK following the traditional power stations, will become essentially power technological combines. /Text/ /Moscow IZVESTIYA in Russian 16 Mar 82 p 2/ 8927

SAYANO-SHUSHENSKAYA GES--The construction of the Sayano-Shushenskaya GES, slated to become an electric star of the first magnitude, has entered the final stage. The planned rated capacity of the power station is 6,400,000 kW. Six assemblies have already been installed at the power station. The tenth and final assembly is to be started up by the end of the current five-year plan. The builders have concentrated most of their attention on preparing the flood zone of the Sayanskoye reservoir and the construction of the compensation Maynskaya hydroelectric power station, whose task will be to equalize the sharp deviations in water level in the lower water race of the Sayano-Shushenskaya GRES, which occur during the operation of the giant power station during peak hours at full capacity. /Text/ /Moscow IZVESTIYA in Russian 16 Mar 82 p 2/ 8927

MODERNIZATION OF THE BRATSKAYA GES--It would seem that it was only recently that the Bratskaya GES, the largest power station on the Angara River, was called the most modern; but today it has been almost completely renovated. The director of the hydroelectric power station, I. Ustinov, reports, "the modernization of the hydrounits has provided a noticeable addition in capacity - nearly 400,000 kW. There has also been an increase in the reliability of the equipment performance. Previously, for example, the power station operators had to repair the windings of the stators about 15 to 20 times per year. Now they are completely relieved of this "ailment". The period of time between repairs has been increased 1.5-fold with a corresponding reduction in costs. /Text/ /Moscow IZVESTIYA in Russian 16 Mar 82 p 2/ 8927

POWER PRODUCTION OF SURGUTSKAYA GRES--Meters at the Surgutskaya GRES, which operates on casing-head gas, have shown that over a ten year period, i.e., since the start up of the power station, customers have received 100,000,000,000 kW-hours of electricity. The requirement for electricity at Tyumen' oil and gas facilities is steadily growing. In Surgut in connection with this the construction of GRES-2 has been started. /Text/ /Moscow IZVESTIYA in Russian 16 Mar 82 p 2/ 8927

THIRD UNIT AT EKIBASTUZSKAYA GRES-1--At the Ekibastuzskaya GRES-1, the largest power station in the Kazakh SSR, the third power unit has been put into operation. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 23 Feb 82 p 1/ 8927

SECOND POWER UNIT AT ALMA-ATINSKAYA TETS-2--The second power unit of the Alma-Atinskaya TETS-2 has been put into operation. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 23 Feb 82 p 1/ 8927

POWER LINES FOR KAZAKH SSR--Electric power transmission lines have been put into operation with a rated capacity of 35 kV and a length of 3,925 kilometers. For the electrification of agriculture power lines with a voltage of up to 20 kV and a length of 10,600 kilometers have been put into operation. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 23 Feb 82 p 1/ 8927

1,500 KILOVOLT POWER LINES IN KAZAKH SSR--For the first time in world practice, the construction of a 1,500 kV high-voltage electric power transmission line between Ekibastuz and the Center has gotten underway in the Kazakh SSR. The length of the line is 2,414 kilometers. /Text/ /Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 23 Feb 82 p 1/ 8927

CONSTRUCTION AT KATEK--Problems with the construction of facilities within the Kansk-Achinsk fuel and power complex were mentioned in the article of Academician A. Aganbeyan. ("Change Your Habits" - STROITEL'NAYA GAZETA 21 Oct 81). As reported to the editors by the deputy chief of the USSR Ministry of Power and Electrification's Glavenergostroy /Main Administration for the Construction of Power Stations/, B. Kabelev, the technical-economic justification for the construction of the first section of the KATEK has been developed

for the period through the year 1990. In addition, the construction of the first GRES of the Berezovskaya GRES-1 complex has gotten underway and the development of the technical-economic justification for the Berezovskaya GRES-2 is being completed. However, the fulfillment of the assignments is still lagging behind the established time periods. The reason for this is the low rates for completing housing and social and services facilities, which leads to a shortage of personnel. There is also a problem in providing for the timely assembly of equipment for facilities of the construction industry. To fulfill the tasks established for assimilating the fuel and power resources of the Kansk-Achinsk basin the Ministry of Power and Electrification has developed and presented for review by the directive organs a list of measures calling for the reorganization of the structure of construction and installation organizations. The goal has been set to bring the intensiveness of fulfilling volumes of construction and installation work on the KATEK to 300,000,000 rubles per year and to complete 400,000 to 450,000 square meters of housing per year during the years 1982 through 1985. /Text/ /Moscow STROITEL'NAYA GAZETA in Russian 14 Feb 82 p 2/ 8927

RAZDANSKAYA GRES REPORT--A new electric power "river" has joined the electric power transmission system of the northeast of the Armenian SSR. A LEP-110 has been put at industrial load. The aerial power path with a length of 40 kilometers has started providing the developing area of Sevan with power from the Razdanskaya GRES. The high rates of development are a special feature of Armenia's electric power industry in the 11th Five-Year Plan. Now a new stage in electrification has begun. Reserve LEP lines are being built and the power networks are being ringed together. A reliable power base is being created for the further development of the republic's national economy. /Text/ /Moscow SEL'SKAYA ZHIZN' in Russian 20 Feb 82 p 1/ 8927

ZUYEVSKAYA GRES REPORT--The labor baton of the Zuyevskaya GRES has been accepted by the collective of the new electric power station, which was raised nearby. Yesterday the Zuyevskaya GRES-2 began producing current. Its rated capacity is 2,400,000 kW - eight times greater than the old Zuyevskaya GRES, which has outlived its service life. Going on watch, the power station operators plan to have the first power unit, a 300,000 kW capacity, at rated capacity ahead of schedule. /Text/ /Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Feb 82 p 1/ 8927

KIYEVSKAYA TETS-6 REPORT--The first power unit of the Kiyevskaya TETS-6, the largest in the Ukraine, has been put into operation. Its rated capacity is 250,000 kW of electricity. The construction of three more such power units is planned. Following their completion, the TETS will be able to provide electric power and heat for apartment buildings with a population of one million residents. /Text/ /Moscow KRASNAYA ZVEZDA in Russian 7 Mar 82 p 1/ 8927

NEW POWER LINES IN KAZAKH SSR--The second year of the five-year plan has gotten successfully underway for the collective of the oldest mechanized column in the Kazakh SSR; this collective specializes in laying of electric power transmission lines. The plan for the first two months of the year was significantly overfulfilled. We managed to build and put into operation nearly 870 kilometers of power transmission lines to be used for various purposes. The collective of sector No 3, headed by senior technician G. Leykht, distinguished itself more than the others. In spite of unfavorable winter weather conditions, this collective fulfilled work valued at 43,000 rubles more than what had been assigned. In laying the line for the long-distance transmission of 1,500 kV direct current from Ekibastuz to the Center, this collective of installers assimilated two million rubles worth of work instead of the 1.65 million rubles called for in the plan. For their high production indicators, G. Leykht's collective has been awarded the title of "best sector of the USSR Ministry of Power and Electrification". Among the front ranks were the drivers of the support transport vehicles, the brothers Vasiliy and Konstantin Ponedel'nikov, N. Mikhaylenko, brigade leaders I. Dmitruk, A. Yesayan, power linemen N. Yerygin, Yu. Puzyr' and others. Now the Pavlodar workers are engaged in the construction of an especially important facility for this year - the high-voltage line from Ekibastuz to Omsk. Already this 500,000 volt mainline must be put into operation along with the other operating lines and provide an outlet for Ekibastuz power into Siberia. To speed up the work G. Leykht's collective is being dispatched there along with other leading brigades, which are now to complete a volume of work amounting to two million rubles. At the same time the installation of the world's most powerful energy bridge for the alternating current of Ekibastuz is proceeding along a broad front - the 1,150 kV line between Ekibastuz and the Urals. Before the end of the year it is planned to put the first section into operation--to Kokchetav. [By V. Kokhanov] [Text]

[Alma-Ata ~~KAZAKHSTANSKAYA PRAVDA~~ in Russian 16 Mar 82 p 2 ] 8927

ZAPORozHskAYA AES POWER--The Khar'kov Energoset'proyekt Institute has come up with a design for a 196-kilometer stretch of 750 kV power transmission lines for "transporting" the current of the Zaporozhskaya AES into the Dneprovskaya power system and the nearby regions of Donetsk. Surveying is now underway on the route of the LEP. The LEP will proceed from Energodar to the by-pass of the Kakhovskoye Sea to Vol'nyanskiy rayon, where a transformer substation will be built. To reduce the time periods for the construction the Khar'kov scientists have suggested that the already existing 750 kV LEP that runs from Donetsk to Dnepropetrovsk to Vinnitsa be used. The specialists have come up with one more novel idea: to feed signals on automation and telemetry, which will constantly monitor the operation of the equipment, the installers will not have to install additional cable

communications - their role will be played by the LEP lines, which carry.../Remainder of text not available/ [Text] /Kiev RABOCHAYA GAZETA in Russian 24 Mar 82 p 2/ 8927

PSKEM RIVER CASCADE--The layout for the electric usage of the Pskem River in the western Tyan'-Shan Mountains was prepared by the Sredazgidroproyekt /Central Asian hydroelectric power station design institute/ Institute. On the mountain river, the annual power potential of which reaches three billion kW-hours, as a beginning it is planned to build two hydrounits with reservoirs having a useful capacity of nearly one billion cubic meters. The sectioned sector for the first of the reservoirs - with a 200-meter dam - was selected at a point some 50 kilometers from the Charvakskoye reservoir, into which the river flows. The rated capacity of the power station will be 450,000 kW. The Pskem is the continued development of the Chirchik-Bozsuyskiy power system, the start of the use of which was called for in the Goelro plan. Now the Chirchik-Bozsuyskiy branch of the river supports 19 hydroelectric power stations. The largest of these stations is the Charvakskaya, which has a capacity of 600,000 kW with a reservoir capacity of two billion cubic meters. After the taming of the Pskem River, the cascade will contain 21 hydroelectric power stations. The Pskem GES's will be built in easily accessible locations and where construction materials are inexpensive and locally available. They will not require the flooding of large economic zones. [By G. Dimov] [Text] [Moscow IZVESTIYA in Russian 6 Mar. 82 p 2] 8927

MARYYSKAYA GRES REPORT--New rivers of electricity have run above the sand dunes. The high-voltage power transmission line which has been put on load has joined the Maryyskaya GRES, where power unit No 6 has gone on line, with the unified power ring of Central Asia and Kazakhstan. Through this gigantic bridge the neighboring republics will receive as much as 10 million kW-hours of inexpensive electricity every 24 hours. "Thus are we repaying our debt to our country," says the director of the power station, S. Nuryyev. "In constructing the first section of our GRES more than 80 plants from all republics participated. Turbines came from the RSFSR. From the Ukraine we received transformers and from Belorussia - instruments. The Uzbek SSR and the Azerbaijan SSR sent their best installers. A harmonious multinational collective of builders participated in the struggle with difficulties. The power station became a base for the training of skilled personnel for the republic's rapidly developing power industry. During the start-up of the first power unit, an important role was played by specialists, whom we had invited to help us. Today 80 percent of the GRES collective is made up of workers trained at the power station. By the end of the five-year plan it is planned to increase the output of electric power in Turkmenistan by 1.8-fold. [By V. Ruzayev] [Text] [Frunze SOVETSKAYA KIRGIZIYA in Russian 24 Mar 82 p 2] 8927

EKIBASTUZ FUEL AND POWER COMPLEX REPORT--The USSR Ministry of Power Machine Building has reviewed the article "Deliveries for the Ekibastuz Fuel and Power Complex" /E TEK/, which was published on 22 January 1982 in the newspaper STROITEL'NAYA GAZETA. This article subjected the ministry to criticism for the lack of stand testing of steam turbines and the delivery of pipelines to the Ekibastuzskaya GRES-1 in "sections". The problem of steam tests of turbines on stands of the manufacturing enterprises is an urgent matter, which is now being carefully studied by the USSR State Committee for Standards, the USSR Ministry of Power Machine Building, and the USSR Ministry of Power and Electrification. The USSR Ministry of Power Machine Building believes it to be unwise to subject turbines to stand tests at the manufacturing enterprises. The enterprises of the sector have developed and carried out technical measures, which are making it possible to achieve a high quality of assemblies and parts for the steam turbines. Recently there has been a significant rise in the requirements for all technological processes, including the quality of the assembly, which is making it possible to omit stand testing. In addition, in plant conditions it is nearly impossible to ensure tests of turbines at estimated working parameters of steam and to obtain a full picture of the functioning of equipment. As regards deliveries of pipelines by the Belgorod power machine building plant, we report the following: pipelines for six power units, including in 1981 for power units No 5 and No 6, have been shipped to the Ekibastuzskaya GRES-1. The delivery of pipelines, supports and suspensions is being accomplished according to technical specifications agreed upon by the customer. There have been no complaints from the customer. [By Yu. Kotov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 26 Feb 82 p 2] 8927

SHAMKHORSKAYA GES REPORT--Shamkhor, 16 February (Azerinform). A new stage in work has gotten underway at the construction site of the Shamkhorskaya GES. The builders have started pouring concrete for the spiral chamber and the foundation for the stator columns of the first turbine, with a rated capacity of 190,000 kW. The first multi-ton parts of the stator have been delivered to the installation site by the Khar'kov electrical machinery builders. The hydroelectric power station builders are actively participating in the competition to provide a worthy greeting for the sixtieth anniversary of the USSR. The collectives of all basic sectors are meeting their assignments and increasing the amount of work that they are doing. They must pour 78,000 cubic meters of monolithic concrete and 10,000 cubic meters of preassembled reinforced concrete and remove 3,800,000 cubic meters of earth. The timely fulfillment of these and several other important start-up operations will make it possible at the start of December to hand over the first turbine full month ahead of schedule. The Shamkhorskaya GES, with a rated capacity of 380,000 kW, has been called upon to help solve several important national economic tasks in the western portion of the republic. When the hydroelectric power station reaches full capacity, the generation of electricity will be increased by nearly 900 million kW-hours per year. The reservoir containing nearly 2,700,000 cubic meters of water will provide water for more than 75,000 hectares of rich lands in Shamkhorskiy, Khanlar-skiy and Kasum-Ismailovskiy rayons. /Text/ /Baku VYSHKA in Russian 17 Feb 82 p 2/ 8927



## ENERGY CONSERVATION

### USSR MINISTRY OF TRADE OFFICIAL ON CONSERVATION

Moscow SOVETSKAYA TORGOVLYA in Russian No 3, Mar 82 pp 34-35

[Article by V. Klyuchnikov, Chief of Main Administration of Science and Technology and member of board of USSR Ministry of Trade: "Utilize Energy Resources Efficiently"]

[Text] It was pointed out in the decisions of the 26th CPSU Congress that a further increase of the efficiency of our country's economy depends to an ever-greater extent on efficient use of the developed production potential and universal conservation of all types of labor, financial and material resources. The special decree of the CPSU Central Committee and the USSR Council of Ministers on this question, adopted in June 1981, requires that skillful and thrifty consumption of existing resources, a special place among which is occupied by fuel and energy resources, be guaranteed in all sectors of the national economy.

The problem of their conservation is also timely for commerce. The development of the material and technical base increases its power available per worker. More than 570,000 enterprises equipped with various types of trade-production, cooling and hoisting-transport equipment, are now numbered in state commerce. The number reaches four million units. A total of 95 percent of this equipment operates on electric power.

Thermal equipment in electric heating is the most energy-consuming. Its stock comprises 850,000 units and the total installed capacity is 10 million kW. This is three times greater than the capacity of such a large electric power plant as the Krivorozhskaya GRES-2. The thermal equipment may consume 20 billion kW·hr of electric power per year under full load--2.2 times greater than the Voronezhskaya Nuclear Power Plant generates.

During 1981 the enterprises of the system of the USSR Ministry of Trade achieved a saving of 400 million kW·hr of electric power by implementing a complex of organizational and technical measures. This quantity is equal to the total annual limit of electric power consumption by the Ministries of Trade of Moldavia, Lithuania, Armenia and Kirgiziya.

The following example clearly indicates the need and capability of conserving electric energy at enterprises of commerce. A single kW·hr of electric energy

is sufficient to smelt 1.5 kg of steel, to mine 30 kg of coal and to bake 36 kg of bread. The same amount of energy is expended during 5 minutes by an electric burner on high setting when its ring is set on no-load.

What are the reserves for conservation of electric energy at trade enterprises? To answer this question, one must first consider the structure of the energy supply of the sector. A total of 60 percent of electric power is required in the overall balance of consumption for public feeding at enterprises, 37 percent is required by retail trade and 3 percent is required by wholesale trade. The structure of energy consumption is also important for lighting, advertising and operation of equipment. Thus, the equipment in food stores consumes 80 percent of the electric energy, the equipment in department stores consumes up to 30 percent and the equipment at public dining enterprises consumes up to 90 percent.

These data permit one to determine the basic directions for conservation of energy resources. First, this is making production processes more efficient by providing efficient operation of equipment, optimum temperature conditions and optimum lighting levels. These measures permit one to reduce electric energy consumption by 10-30 percent.

For example, replacing incandescent lamps by fluorescent, metal-halogen and mercury lamps reduces the consumption of electric energy by almost half for lighting of trade halls and production buildings.

Regime schedules of equipment operation during food preparation are used at public catering enterprises of Moscow. This reduces the consumption of power electric energy to 5 percent and also "smooths out" the peak loads in output.

Second, a large reserve for conservation is hidden in maintenance and repair of equipment. It is known that the worst enemy of water heating equipment is scale, formed on the surface of vessels and TEN [thermoelectric heater]. If it is not removed in time, the increasing thermal resistance increases the operating time of the equipment and accordingly the specific consumption of electric energy per unit product by a factor of 2-3.

It is absolutely impermissible to operate energy-consuming electric burners with malfunctioning rotary switches. Thus, the ring of the burner consumes from 3 to 3.5 kW·hr on the strong setting, while timely switching it to medium and low setting reduces electric energy consumption by a factor of 2-4. This confirms the operating experience of the public catering enterprises of Moldavia, at which all burners are supplied with switches. Development of an automatic device that switches off the ring from the electric network if it is not loaded has begun here.

The coefficient of the operating time of a machine in commercial cooling equipment usually comprises 0.3-0.5. If the cooling agent in the system is insufficient and the snow "overcoat" exceeds 5 mm, then the machine essentially operates without stopping. Efficiency specialists of the Moscow specialized cooling equipment combine introduced automatic thawing of the evaporators of stationary chambers. This reduced electric energy consumption by 28 percent.

And finally, third, the technical parameters and design of energetically more efficient equipment must be improved, extensively utilizing means of automation, due to which electric energy consumption can be reduced to 30 percent.

Calculations and control tests of the most energy-consuming thermal equipment show that their efficiency, i.e., the efficiency of electric heating devices, is still very low and does not exceed 0.4-0.5.

Based on the enumerated directions, one should determine specific problems for conservation of energy resources. Implementation of them requires extensive organizing work in both trade organizations and at enterprises. It should be directed not only toward observing the established limits of consumption of electric energy and other types of fuel, but also on achieving conservation of them.

Since last year USSR Gosplan and USSR Minenergo [Ministry of Power and Electrification] have introduced a new procedure for planning the consumption and limits of energy, but to which limits are set for all trade and public catering enterprises. However, the practice of this limit is still imperfect.

Thus, the republic Gosplan in the Russian federation determines limits to RSFSR Mintorg [Ministry of Trade] only for the enterprises subordinate to it (Rosmyasomoltorg [expansion unknown], Rosbakaleya [Republic Office of the Wholesale Trade in Sugar, Confectionery, Canned Goods, Tobacco, Salt and Other Groceries]), while the limits for trade and public catering enterprises of oblast subordination are set by the gorplans or oblplans of these cities and oblasts. RSFSR Gosplan also determines the limits for a number of large, energy-consuming trade and public catering enterprises of Moscow. This is related to the fact that, for example, the established capacity of enterprises of the main public catering enterprise of the Mosgorispolkom comprises 700,000 kW or 268 million kW·hr annually, that is approximately 30 percent in the total energy consumption budget of organizations of Mossovet [Moscow City Soviet of Workers' Deputies].

The Gosplan of the republic in the Moldavian SSR sets the limits of electric energy and liquid fuel consumption for the Ministry of Trade, which it allocates to 28 subagency organizations and enterprises (administrations of trade and public catering administrations and enterprises of republic subordination) with division by quarters and months and also the energy supply organizations for monitoring. Trade and public catering administrations in turn introduce limits to department stores, dining halls, bases, warehouses and so on. Mintorg calculates the need for electric energy for the planned period by the consolidated specific norm of energy consumption for thousand rubles of commodity circulation.

The given examples indicate that there is no unified methodological approach in determination of the need for energy resources and distribution of limits by enterprises. This frequently results in underestimation of the need for energy resources since the development of the material and technical base and the need to introduce progressive production processes are not taken into account.

As a result a number of trade organizations and enterprises is now experiencing a shortage of electric energy. For example, the allocated limits delay the introduction of new capacities at Bel'tsy, where Mintorg of the Moldavian SSR is planning extensive introduction of a program to reduce the use of manual labor.

Correct calculation of the technically substantiated specific norms of electric energy consumption on a differential basis by each enterprise that take into account the capacity of installed equipment, expenditures for lighting and advertising and also prospects for development, is of important significance. This calculation should be made according to the Standard methodical instructions of the USSR Ministry of Trade on normalization of electric and thermal energy consumption by trade and public catering enterprises. This permits substantiated planning of the needs for energy resources, monitoring of their consumption and determination of the reserves for conservation.

Quarterly and annual statistical reporting, introduced since the beginning of this year for the system of the USSR Ministry of Trade, to the TsSU [Central Statistical Administration] of the USSR on form 11-SN "Reporting on fulfillment of the norms and tasks on the average reduction of norms of fuel, thermal energy and electric energy consumption" will largely contribute to this.

Material stimulation of the collectives of enterprises should also be used to control the mode of conservation. In 1981 the USSR State Committee on Labor and Social Problems and the Secretariat of the AUCCTU confirmed new regulations on awarding workers and engineering and technical personnel with prizes for conservation of fuel and electric and thermal energy.

The basic indicator for awarding the prize is reduction of the specific norms of energy consumption compared to the confirmed norms. Therefore, these norms must be calculated and confirmed this year on a differential basis for all retail and wholesale trade and public catering enterprises.

The experience of trade and public catering enterprises of Kirovakan is interesting in organization of work to conserve electric energy and to award prizes to enterprise collectives. The principle of mutual interests of the workers of trade enterprises and the repair kombinat Armtorgmontazh in this conservation has been introduced. If a department store or dining hall achieves an actual conservation of electric energy related to operation of equipment during the reporting period, then the fitter-repairman is awarded a prize.

There are many other examples that confirm the prospects for this work, but it yields the greatest saving where the entire collective rather than individual specialists participate actively and with interest in it.

The indicators on the achieved conservation have now become one of the basic indicators in summarizing the results of the socialist competition at all levels.

The USSR Ministry of Trade jointly with sector central trade-union committees conducts an All-Union public inspection annually on the utilization efficiency

of raw material, materials and fuel and energy resources. The results of the inspection in 1980 showed the increased activity of workers of the sector in this important national economic measure. More than 50 percent of the workers in trade participated in the inspection and 3,550 proposals were submitted, of which 2,650 were implemented. The conditional annual saving comprised 1.85 million rubles, 31,000 kW·hr of electric energy was conserved, 9,800 gigacalories of thermal energy were conserved and 6,300 tons of comparison fuel were saved. The All-Union inspection will be conducted during the 11th Five-Year Plan as well.

The program for efficient consumption of energy resources must be implemented at the corresponding engineering level, extensively recruiting the scientific and technical community by increasing the activity of all trade workers. This will contribute to fulfillment of the important task posed by Comrade L. I. Brezhnev at the November (1981) Plenum of the CPSU Central committee: "Guarantee the strictest conditions of conservation in use of all types of resources and operationally and rigidly intercept mismangaement and wastefulness."

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## ENERGY CONSERVATION

### TRAINING OF ENGINEERS IN USE OF ENERGY

Moscow IZVESTIYA in Russian 29 Apr 82 p 3

[Article by I. Shporta, director of Belorussian branch, All-Union Scientific Research and Planning Institute of Power Engineering Industry, and Candidate of Technical Sciences I. Kal'tman, sector head of the institute: "Does the Technician Know the Problems of Power Engineering?"]

[Text] It has already been established that fuel was regarded as an accessible and inexpensive resource over the many decades of existence of our industry. This was also reflected in the technical policy of a number of sectors and in the technical and economic operating indicators of industry. Technicians of the corresponding specialty see their main task as producing articles with given properties and completely forget about the fact that the technology of industrial production is nothing more in its physical essence than the aggregate of purely power engineering processes.

With the exception of energy production and to some degree of chemical production, the problems of the power engineering of production processes are not even considered in the training of technician specialists. As a result the technician is simply incapable of controlling the energy flows in production.

To what has all this led? Many externally successful industrial production processes are inefficient and require replacement by more progressive processes. Thus, oil refining permits nonbeneficial flaring-off of large quantities of casing-head gases, although the burning gases can be used after specific "finishing" at the same oil refining plants as a raw material or as a fuel. The articles at bearing plants are repeatedly heated to 800-1,200 degrees Celsius by the existing mass production technology and are then essentially cooled to the surrounding temperature. This is the traditional technology. And moreover, a cycle without complete cooling of parts is feasible and essentially possible.

Various production gases are finding ever greater application in machine building. And the approach is not economical everywhere. For example, units have been installed at the Minsk Automotive Plant to produce carbon dioxide from fuel combustion products, which is burned especially for this purpose. The nitrogen that remains the main component of the combustion product is discharged as wastes. At the same time a unit is operated for nitrogen production in another shop of this enterprise.

The Minsk Tractor Plant imports carbon dioxide from other cities for its own production needs. And it discharges an enormous quantity of carbon dioxide with flue gases from combustion furnaces in the form of wastes.

There are many such examples. This is so partially because the main power engineering services, which are incapable of solving these complex problems competently and in a multiple fashion, now manage the efficient use of fuel and energy at enterprises. These services are made up of specialists in industrial power engineering who are untrained in the field of production technology.

Yet another aspect of the problem is the nonsystems approach to measures in fuel and energy economy. This serious deficiency is inherent to many enterprises. The most effective measures are not included in the plans, but those which are closest to and understandable by engineering developers are included. Exaggerated rather than the most progressive norms of fuel consumption are frequently established at enterprises.

Specialized scientific subdivisions on fuel and energy economy have begun to be created during the past few years in some sectors. As an example one can cite the Avtoremproyekt Institute [expansion unknown], which is involved in these problems on the scale of the Ministry of the Automotive Industry. But these subdivisions require All-Union coordination and management from a specialized center (institute). It could work out an intersector strategy of technology power engineering management based on the systems approach.

The systems approach to management of technology power engineering also advances yet another important problem. Both existing and planned production must be considered from ecological rather than from only ordinary production aspects. This permits early determination of the degree of ecological imperfection of technology and makes it possible to determine the optimum priority of measures to reduce fuel and energy consumption.

One must also remember the following when planning the strategy of fuel economy in industry. We now increase the efficiency of fuel and energy utilization in the traditional manner--by improving equipment and technology, we make the consumption conditions more efficiency, we utilize secondary resources and so on. This method still has deep reserves but its prospects are limited.

A more promising and just as important route toward a reduction of fuel and energy consumption in industry is conversion to low-waste, energy-conserving technologies. These processes may include, for example, production of forgings without multiple cooling to low temperatures, production of various types of production gases, specifically, carbon dioxide from waste combustion products rather than from fuel, and so on.

Moreover, even the simplest and most accessible energy-conserving technologies are still being introduced very slowly. Let us present just two examples. More than five years ago a step-by-step use of flue gas heat was used at the Gor'kiy Automotive Plant. The innovation does not require either scare materials or organizational rearrangement of production and it yields a considerable

advantage. But the progressive technology has also not achieved wide distribution. It is partially applied in Belorussia at the Minsk Tractor Plant. And the managers and specialists of the Minsk Automotive and of many other enterprises are not at all interested.

Minavtoprom [Ministry of the Automotive Industry] of the USSR is slowly introducing furnace atmosphere activation devices which were developed at the Minsk Design and Experimental Production Institute of the USSR Automotive Industry. And they permit a saving of up to 80 percent of natural gas to non-retort furnaces for production needs.

The Promenergoprojekt Institute, USSR Minenergo [Ministry of Power and Electrification] was transformed in 1974 to the All-Union State Scientific Research and Planning-Design Institute for Industrial Power Engineering and efficient use of fuel, electric and thermal energy and secondary energy resources (abbreviated VNIPIenergoprom) in industry. They retained the functions of working out the problems of centralized heating of the national economy and were entrusted with new functions of the head organization in working out intersector problems of industrial power engineering. However, the basic production volume of the institute now comprises scientific research and planning work in development of new and expansion of existing TETs, boiler plants and so on. Scientific research work in industrial power engineering occupies approximately 4 percent of the total volume. Under these conditions VNIPIenergoprom is incapable of becoming an All-Union center capable of implementing an intersector strategy of management of technological power engineering. The tasks posed by the 26th CPSU Congress in the field of conservation of fuel and energy resources require maximum mobilization, concentration and integration of the efforts of everyone participating in this most important state matter.

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## ENERGY CONSERVATION

### ENERGONADZOR INSPECTOR ON WASTE IN MOSCOW

Moscow MOSKOVSKAYA PRAVDA in Russian 8 Apr 82 p 2

[Article by G. Maslennikov, chief of heat inspection of Energonadzor, Moscow Regional Administration of Power System Management: "A Geyser at the Base"]

[Text] The conversation on the problems of technical equipping of fruit and vegetable bases, begun on the pages of the newspaper, is seemingly unrelated to thermal power engineering. Nevertheless it was of interest to us for one simple reason: heat consumption by Moscow bases exceeds .5 million gigacalories annually. They are equivalent in this indicator to several industrial enterprises.

The quality of the product reaching the table of the consumer is largely dependent on how their energy services cope with their own tasks during the heating season. Observing specific parameters of microclimate in storehouses, the presence of steam or hot water (both for production and for heating), a functional hot water supply and normal functioning of ventilation systems are all senseless without dependable, safe and, which is no less important, economical operation of power engineering equipment.

It is at this level of operation toward which we turn our attention. To do this, let us return to the materials of checks made by inspectors of Energonadzor during the heating season.

The Kiev Fruit and Vegetable Office met us with clouds of steam which literally cover some buildings, including one of the heating stations (TP), which is directly counter to the service of the chief engineer. The administration has thus not fulfilled the schedule issued by the inspectorate as early as November. The heating stations have not been put in order and the temperature of the water circulating in the heating systems is constantly rising. Walking through the base, you see how here and there hoses poke out of the walls of buildings. This is how the shop workers regulate the temperature conditions of heating, dumping the condensate into the sewer.

After this you can understand why its return to the boiler plant of the enterprise comprises only about 20 percent. Hence, the overconsumption of fuel, chemicals and so on. We were amazed at the heating station of the automatic turning shop: uninsulated pipelines and heaters and malfunctioning counting

devices. The heating station was literally transformed to a storeroom. What couldn't one find here! Padded jackets, shoe liners, old clothes, tires, metal workers' tools, fittings and all kinds of other objects.

How can one talk about observing the heat consumption conditions and safe and economical operation? It is no wonder that losses reach more than 800 gigacalories per quarter.

The Moskvoretskiy Board has also not completely fulfilled the inspection schedule. It continues to dump condensate from the heating systems into the sewer. Steam and hot water losses through the packing of fittings and flange connections and through the numerous "fistulas" that appear in pipelines have not been eliminated and heat curtains are not operating. The meters are not operating in the boiler plant itself and the heat of continuous purging of boilers is not being utilized. The total losses are 1,500 gigacalories per quarter. The situation with efficient use of thermal energy is also similar at the Krasnopresnenskiy Fruit and Vegetable Board.

Each of the indicated organizations confirmed its readiness for the heating season in the fall. It is obvious that they formally approached this problem at Glavmosplodoovoshchprom [expansion unknown]. All the enterprises of the main board participated in the All-Union public inspection of the efficiency of using raw material, materials and fuel and energy resources. At the same time we did not find a single item in the socialist pledges of the collectives that concerned thermal and electric energy economy. The extent to which it was conserved last year could be named only at the Dzerzhinsk and Proletariya boards.

The poster "Be economical with economics" was obvious in the administrative building of the Leninsk Fruit and Vegetable Board. We were interested from the enterprise managers how they are implementing this slogan. But the chief engineer V. Antoshin was unable to find a single document that indicates work in conservation of fuel and energy resources.

We were shown reports at enterprises where deficiencies were detected that confirm fulfillment of the plans for organizational and technical measures and for achieving thermal energy conservation. One thing did not penetrate the consciousness: How was it possible to conserve with such enormous losses? The explanation can only be that the standards for thermal energy consumption are determined "by eye" and are therefore too free.

Not one of the power engineers had any idea of the monthly thermal and steam-condensate budgets. And one can hardly talk seriously about some accounting analysis of heat consumption when there are sometimes no elementary instruments at enterprises and if there are, then they are malfunctioning.

This idea was followed in the conversation with the power engineers: seemingly the administration is not our concern--the primary concern is the problem of product sales. Undoubtedly, it is an important task to conserve and implement it in time. But it is no less important to do this with the least losses and expenditures. And technology does not solve this but rather the attitude

of people to the matter. The inspector made this remark to the workers at the automatic turning shop of the Proletariya Board:

"You left the lights on in three empty rooms during the lunch break."

"And we always do this," was the answer.

As they say, there is no need to comment here. The success that people have in solving matters has long ago become a written truth. It is frequently repeated, but they somehow forget that these people should work continuously and purposefully to achieve success. But at all the bases we visited without exception the management of the organization or the managers of the technical and power engineering services were completely replaced during the past five years.

One can hear everywhere that the power engineering services are staffed only by half and that the qualifications of personnel leaves much to be desired. The chief engineer of the Proletariya Board used this to explain the deficiency in the use of thermal energy and delays in making routine and capital repairs.

All this is true. But the staffs of power engineers are complete at the Dzerzhinsk and Leninsk Boards. This means that this is a matter for the managers themselves and is a matter of their persistence. Each organization has its own history. The Proletariy and Leninsk Boards have existed for more than 50 years and the Dzerzhinsk and Kiev Boards have existed for 10 years. But their misfortunes are the same.

Heat management is being improved at slow rates and systems and heat-utilizing installations are being replaced. The deficiencies are multiplied each year. Tests of the heating lines are carried out at low pressure at the Proletariya Board--they are afraid that they will not be successful. This is how it happens: only one or two steam or hot water leaks are corrected and they have to go to a new place. And one patch is placed over another.

The lines are frequently without heat insulation for the winter after repair. All this together with the ground water results in premature failure of the steam and hot water pipelines. This is how "geysers" are multiplying on the territories of fruit and vegetable bases.

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## ENERGY CONSERVATION

### LENINGRAD OFFICIAL ON CONSERVATION

Tallinn SOVETSKAYA ESTONIYA in Russian 20 Feb 82 p 2

[Article by V. Lankin, party committee secretary of All-Union Scientific Research and Planning Institute of Aluminum, Magnesium and the Electrode Industry, and A. Ozhegov: "'Energy' Multiplies Forces"]

[Text] One of the bright spots of the 11th Five-Year Plan is multiple purposeful programs, development and fulfillment of which assists in practice solution of a vital problem indicated in the Annual Report of the CPSU Central Committee of the 26th Party Congress: "...overcome the lack of coordination of the actions of different agencies."

These programs are also being prepared in our republic. One of them, which as expected will be implemented this year, is called upon to concentrate the efforts of a number of enterprises and organizations in conservation of fuel and energy resources. And specifically by development and introduction of equipment and production processes into production that reduce the consumption of electric and thermal energy.

The good experience of development and fulfillment of these programs exists in Leningrad, where essentially all the large enterprises, institutes and design offices have been recruited to implement them. All this activity is being monitored and directed with the assistance of the Council for Economic and Social Development attached to the oblast committee of the CPSU, the inter-agency coordinating council of the USSR Academy of Sciences, the headquarters and committees created in the raykoms of the CPSU, the party committees of associations and scientific research institutes.

The complex purposeful programs are being monitored by the party committee: such is the leading topic of this article that talks about the experience of VAMI---The All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry.

What an enterprise becomes and how efficiently electric energy is used in its shops largely depend on our specialists and on the extent to which they fully and accurately take into account the modern advances of science and technology in their own planning decisions.

I will cite one example. Many plants created from the drawings of VAMI produce aluminum rolled wire. Thus, an increase of its electric conductivity by approximately 1-1.5 percent, according to calculations of candidate of technical sciences A. Yu. Tayts and other scientists, would permit an annual saving of up to 40 million rubles in the country. But to do this, the content of impurities in the metal must be reduced somewhat, which is impossible without improvement of the electrolysis process. This problem is now being solved successfully by the institute.

Energy conservation is a far from simple task. There are still those cases where the plan--both economical and modern--is good for everyone. But when it is embodied in concrete and metal it loses the force of "objective" reasons of change, alas toward the worst side.

The party committee of VAMI analyzed the reasons for these situations. And it was determined that in some cases our designs were implemented without being tied into a specific plant, without regard to the equipment operating there, the qualifications of personnel, the products produced in the shops and so on. But to design "without reason" on the principle "we thought about it and made drawings and you should not do anything about it" means to operate inefficiently. The modern program-specific approach to planning of work throughout the entire production chain--research-design-construction and industrial assimilation--guarantees success. The efforts of various scientific research, planning and production collectives are explained within the framework of a single complex program aimed toward achieving a high final result. It is this principle of organization of collective labor in solving large economic problems that was approved in the decisions of the 26th Party Congress.

A program-specific method was also used to organize the work of Leningrad sector institutes and industrial enterprises in conservation of fuel and energy resources. The complex specific program Energiya was first created in the country. It was developed by the section for efficient use of fuel and energy resources and improvement of energy-consuming production processes, existing in the oblast headquarters for power engineering attached to the Council for Economic and Social Development of the Leningrad obkom of the CPSU, based on methodical recommendations of the scientists and specialists of VAMI. It was also worked out on a sector (for power engineering sectors of industry, the head organizations of which are located in Leningrad) and on a regional scale (for industrial enterprises of our city and oblast) for the period 1981-1990.

Working out a program is only the beginning of a larger matter. Planned measures may become only their own type of the sum of good wishes if clear interaction of all sections and verification of the fulfillment of that planned are not organized.

How is the Energiya program being managed?

It is concentrated at our institute, which is the head organization of the section for efficient use of energy resources. The director of VAMI, candidate to membership in the CPSU obkom, doctor of technical sciences N. A. Kaluzhskiy has been confirmed as chairman and laboratory head and winner of the USSR State Prize A. N. Tatakin has been confirmed as scientific secretary.

The main role in Energiya has been allocated to our collective because the enterprises of the aluminum industry, which are erected from our drawings, consume more than half the electric energy of all plants of the country's nonferrous metallurgy. Who then but us is to play the first violin in collective work on energy conservation? Even more so since we have accumulated specific experience in this activity.

At the present moment VAMI coordinates fulfillment of the Energiya program by approximately 30 sector scientific and research organizations and almost 500 energy-consuming enterprises of Leningrad and Leningradskaya Oblast. We naturally sensed how the loads in the departments and laboratories have increased and how the information flow was increased. Therefore, the question arose at the routine meeting of the party committee on the need to create a special working body at the institute which would directly and daily manage the work of the labor collectives on conservation of fuel and energy resources, which would manage acceleration of introduction of new energy-conserving production processes and units into production and which would manage fundamental improvement of the existing energy-consuming production equipment. We decided on organization of a special energy-utilization laboratory for this purpose. Its management has been entrusted to member of the party committee, candidate of technical sciences G. F. Vedernikov. Having created a new subdivision headed by competent and energetic scientists, we knew how to improve verification of fulfilling the Energiya program.

The scientists and specialists of VAMI have carried out a complex examination of the Bratsk Aluminum Plant--the country's largest enterprise in energy consumption. Significant opportunities for energy conservation were sought together with the producers. The results of the work were discussed at a meeting of the party committee and at party meetings of the departments where the design of the gigantic enterprise was created. The idea of converting this plant into a model plant on consumption of fuel and energy resources was born during a collective exchange of opinions. The proposal of the VAMI communists was approved by the USSR Ministry of Nonferrous Metallurgy.

Taking the positive experience of development and fulfillment of the Energiya program at the more energy-consuming enterprises into account, the staff for power engineering attached to the CPSU obkom decided last year to create specific complex programs on conservation of fuel and energy resources in most labor collectives of the city and oblast. This work was entrusted to a coordinating committee consisting of the Northwestern Division of VNIPIenergoprom (head organization), the main fuel and energy administration, energy supply of Lenenergo, the Lensistemotekhnika Association, the Engineering and Economic Institute imeni Palmiro Togliatti and other enterprises.

Management of the Energiya program and monitoring of its fulfillment are carried out in our region through councils for economic and social development of the gorkoms and raykoms of the party, in which permanently acting committees or staffs on the Energiya program have been created. These public bodies and working groups were created at enterprises and in head institutes and special management and monitoring groups operate in them.

The staff on development and implementation of both the sector and regional program is headed at our institute by the deputy director for scientific work, candidate of technical sciences A. A. Kostyukov. The members of the staff and its representative have often reported on their activity at meetings of the VAMI party committee and the party bureaus of the departments. After discussing these reports, we have adopted measures to tie the situation of the socialist competition of specialists more closely to the results of their work in fulfillment of the Energiya program.

Analysis of the measures of the regional Energiya program, conducted by VAMI scientists, shows that 35 percent of conservation of fuel and energy resources are provided by modernization and reconstruction of equipment. Introduction of new equipment yields 9-10 percent and improvement of the energy economy of enterprises yields 4-5 percent. The use of secondary energy resources also results in approximately 15 percent of the entire saving.

The labor collectives of the city and oblast plan on increasing the total economy of energy resources during the current five-year plan 2-3-fold by fulfilling the regional Energiya program. The corresponding indicators have been entered in the socialist pledges of the workers of Leningrad and the oblast. And we are confident that we will achieve that which is planned. The Energiya program multiplies our efforts.

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## ENERGY CONSERVATION

### BRIEFS

ENERGY CONSERVATION--A medium-capacity plant boiler room saves three million cubic meters of gas annually by introducing gas burners which were designed at the Khar'kov Scientific Research Institute of Basic Chemistry. The innovation makes it possible to conserve 30 percent of the gas consumed by industrial enterprises. This is achieved by mixing one part gas with 10 parts air before combustion. The inventors suggested that two-stage cone spreaders be used, which direct the delivered streams of gas and air to counter air flows under pressure. The shape and arrangement of the burners make it possible to produce a homogeneous mixture that burns without a residue. The new devices not only eliminate overconsumption but also incomplete combustion of gas, thus preventing atmospheric pollution with noxious wastes. The innovation is also effective by the fact that it operates identically well at medium and reduced gas pressures. This is especially advantageous during the winter season when fuel consumption increases considerably and pressure in the gas system decreases appreciably. Models manufactured at the institute's experimental plant have undergone state trials and have been recommended for beginning production. Their use at an average industrial enterprise alone will permit conservation of as much gas as is required throughout the year to fully meet the needs of the residents of 3,000 apartments. [Text] [Kiev PRAVDA UKRAINY in Russian 10 Apr 82 p 1] 6521

ELECTRICITY CONSERVATION--An automatic system, the first line of which is connected at Leningrad, may place industrial consumption of electricity under operational control. Introduction of a citywide system is being accomplished within the Energiya regional program. Realization of it by the Leningrad workers will successfully fulfill the socialist pledges this year--to conserve more than .5 billion kilowatt hours. This is sufficient to meet the needs for electricity of such a large enterprise as nonferrous metallurgy as the Pikalevo Association Glinozem throughout the year. [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 31 Dec 81 p 2] 6521

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## FUELS

### A. S. KAPTO ADDRESSES ENERGY ISSUE

Kiev PRAVDA UKRAINY in Russian 12 Feb 82 p 2

[Article: "Work with High Yield"]

[Text] The collectives of the mines, plants and construction sites of Donetsk are laboring with great enthusiasm on the shock watch in honor of the 60th anniversary of formation of the USSR. Fulfilling the decisions of the 26th CPSU Congress and the 26th Congress of the Ukrainian Communist Party, many of them have fulfilled intensified tasks of the first year of the 11th Five-Year Plan ahead of schedule.

The workers of the mining capital today expressed the unanimous approval of the economic and social policy of the communist party and Soviet government and the desire to work with greater output at a meeting of the deputy to the Ukrainian SSR Supreme Soviet, candidate to membership in the Politburo of the Central Committee of the Ukrainian Communist Party, secretary of the Central Committee of the Ukrainian Communist Party A. S. Kapto with electors of the Leninsk electoral district.

Giving a talk to the electors, A. S. Kapto characterized the results of fulfilling the national economic plans of the country and of the republic during the first year of the 11th Five-Year Plan and noted the important contribution of Donetskaya Oblast, Donetsk and Leninskiy Rayon of the city. He dwelt in detail on the great and important tasks which the labor collectives must solve during this and subsequent years of the five-year plan. To guarantee fulfillment of the plans and the adopted socialist pledges, the speaker emphasized, they should now devote the most serious attention to problems of intensification of production, more efficient use of available production potential and should observe the strictest conditions of conservation. In 1982 they must achieve a fundamental improvement of work of the coal and metallurgical industry and put more than 30 of the most important facilities of production designation into operation.

An important role is allocated to the ideological and political educational work of party organizations, said A. S. Kapto, in solving these problems. It is very important to raise the scientific level of the work, to utilize diverse means of ideological influence for propaganda and introduction of leading production experience, ideological tempering of workers, especially of

youth, and generating public opinion against violators of labor discipline and carriers of the customs of the past.

During his visit to Donetskaya Oblast, A. S. Kapto visited the Donetsk Refrigerator Plant, the sovkhos Metallist in Amvrosiyevskiy Rayon, Donetsk State Medical Institute imeni M. Gor'kiy and the interschool training and production combine of Snezhnoye. He held conversations with the workers, students, teachers and vocational students on problems of organizing a socialist competition, of increasing the effectiveness of the training process and of improving ideological educational work and working and everyday conditions. A. S. Kapto also familiarized himself with the memorial complex to the heroes of World War II at Saur cemetery.

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## FUELS

### REQUIREMENTS FOR NORTHERN DESIGN OIL FIELD EQUIPMENT ANALYZED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 4, Apr 82 pp 45-47

[Article by N. P. Zakharchenko, Glavtyumenneftegaz: "Requirements for Oil Field Equipment for Northern Conditions"]

[Text] The well fund will be increased and its structure will change in the fields of Glavtyumenneftegaz in the 11th Five-Year Plan because of the rise in the volumes of drilling operations and the extraction of oil. By the end of the five-year plan, the fund of extractin wells will reach 32,600, and the mechanized fund will be 22,000 wells (67.6%). In order to maintain extraction from the wells, it will be necessary in 1985 to inject 103.5 billion m<sup>3</sup> of water into the productive beds, make 29,880 maintenance and 5120 major repairs of wells. This will require bringing the number of people in the maintenance brigades to 300 and major repair brigades to 241. It is planned to bring oil preparation to 366.8 million T/year.

The execution of this considerable amount of work will be closely linked to the efficient operation of the surface oil field equipment which is designed for the technological processes of extraction and repair of wells. Many years of operating the surface equipment under field conditions in the Glavtyumenneftegaz have shown that although they meet the requirements in the certificate data, there is still insufficiently high reliability and low adaptivity to working under northern conditions.

For example, the block separator pumping stations with output from 5,000 to 20,000 m<sup>3</sup>/day manufactured by the plants "Neftemash" of Glavtyumenneftegaz and "Sibkomplektmontazh" of the Ministry of Construction of Oil and Gas Industry Enterprises are designed for West Siberian conditions, but are supplied with series-produced pumps that have low reliability in operation. In particular, the NK pump has a weak bearing assembly in the cantilever section and the TsNS pump is not adapted for pumping oil because of the imperfect design of the gasket assembly.

The pumping jacks can be successfully used on the West Siberian fields in making stressed assemblies from steels that are suitable for operating at a temperature of 55°C, and the use of all-weather lubricants. The hydropiston units, both imported and domestic, are very reliable to operate under West Siberian conditions. They will have high operating indicators in cluster drilling.

Fittings of two types are mainly used for equipment of gusher well heads and wells operated by ETsN [expansion unknown]: 1AFT-65 Kr-140 and AFT-210 which correspond to the field conditions of West Siberia. But it is not universal, i.e., is not used in the transition to the mechanized method of oil extraction. Gusher fittings need to be produced with cable lead so that the well head does not have to be re-equipped when the well is switched to the mechanized method of oil extraction (ETsN).

Cluster pumping stations in the block design satisfy the operational requirements. They are supplied with equipment for operating under West Siberian conditions.

Manufacture of cluster pumping stations in large-sized blocks with 100% readiness of the block under plant conditions was mastered in 1978. There are six stations now in operation. However, because of the large weight of the blocks (200-220 T), it is difficult to ship them to the construction site when the roads are impassable.

The maintenance conditions of the injection wells in Glavtyumenneftegaz require installation of pressure regulators at the well head. They were developed and passed industrial testing back in 1979. However, the Ministry of Chemical Machine Construction has not yet determined the manufacturing plant, although the demand for pressure regulators is only 600-800 per year.

Cumbersome, metal-intensive and not very productive units for oil preparation with a large volume of construction operations have been built in West Siberian conditions. New technical solutions were later found which radically altered the nature of the equipment and the conditions for field construction. Blocks were manufactured under plant conditions. The construction periods in this case were reduced 2-4-fold, and the capital investments for building up were reduced by 30-40 percent. Over 80 percent of the facilities for oil preparation currently have block design.

Block-set units made in the GDR are also used to prepare the oil. There are three of these units already in operation. In cooperation with the specialists from the GDR, we are designing block units for central collection points with enclosure of the main production equipment in a framework type building. It is planned to supply the oil workers of West Siberia with 18 sets in the 11th Five-Year Plan.

Units manufactured in series for well repair were not adapted for local conditions of operation and maintenance at West Siberian fields, especially at low temperatures. The enterprises of Glavtyumenneftegaz use a large quantity of special field repair equipment: lifting units, tank trucks, compressors, cementing, flushing and other special units. But under West Siberian conditions, it often does not meet the requirements of increased labor productivity because of the low interrepair period, insufficient reliability and durability, and high specific weight of the manual labor. The designs of these units for northern conditions have not resolved questions of mechanizing the lowering-lifting operations, use of resources for automation, monitoring and protection, guaranteeing enhanced passability of the transportation base, operation at low temperatures, reliability and durability in

less favorable operating conditions, and finally, improvement in the working conditions of the service personnel.

The lifting units AzINMASH-37 and AzINMASH-43A have complicated control based on electric-pneumatic and hydraulic systems, but are not equipped with a reliable system of air drying. Therefore during the winter their operation is difficult and the labor productivity of the brigades is considerably reduced. The pneumatic system of the A-50 unit has this shortcoming.

The units are equipped with an imperfect system for protecting the block and tackle unit under the crown block from wearing out, and the unit "Bakinets-3M" does not have such a system at all. There is no system for automatic control of unit overloading and limiting the stresses during screwing together of the pipes and rods with mechanical keys. During operation there have been cases of damage to the pipe threads and rods and deformation of the posts because of overloads.

The weak link in the tank trucks of all brands is the centrifugal pump for filling the vessel with liquid and for overflow from it. Malfunctions in its operation occur because of the falling of mechanical admixtures in the pump intake and on the rotor runner. The pump cavities freeze in winter and it malfunctions prematurely.

The self-suction system of the pump does not operate in winter since the production liquids generally have increased viscosity. The tank trucks are essentially used with pump units TsA-320 and ANT, i.e., scarce equipment is not used for its purpose.

The UKP8-80 compressors which are designed to develop the wells have low mobility in moving from object to object, unreliable and not durable transport base. The KPU-16-100 compressors are distinguished by unsatisfactory transportability and therefore have low maneuverability (large dimensions and weight).

The cementing and flushing units are not sufficiently reliable under conditions of low temperatures because of the freezing of the working agent (solutions, water) in the cavity of the pump and in the manifold.

Thus, operation of the main types of special units under West Siberian conditions is associated with limitations of a design nature which do not take into consideration the harsh conditions of the region. Their transport base does not permit operation of the unit in the period of impassable roads. The equipment is made of materials that are not adapted for operation at low ambient temperatures. The complicated working conditions of the service personnel are not considered.

Special "northern" design units are supplied in small volumes, but they do not completely meet the requirements for operating under northern conditions. In some units, preheating of the pumps, fuel tanks and storage batteries is done by the exhaust gases of the base engines, but there is no rapid start-up for the engines of the actual unit base. The lubricants used do not allow the unit to move without preheating of the assemblies (bridges, gear boxes,

etc.). The hinged equipment is made in the standard design which does not allow operation below  $-38--40^{\circ}\text{C}$ . The question of improving the working conditions of the service personnel has not been resolved as before.

It should be taken into consideration that the most specific features of the West Siberian fields are the seasonal nature of the work for well repair. During the winter when there are passages into the swampy and lowland sections of the fields, the rates of well repair increase, but difficulties arise in operating the special field equipment because of the low ambient temperatures.

It is consequently necessary to create for West Siberia special field equipment which is capable of providing for the increasing volumes of repair and maintenance of wells under low temperature conditions which dominate for 6-7 months a year.

Since major repair and maintenance of wells in all processes of oil extraction are the most labor-intensive and are characterized by high specific weight of manual labor, improvement in the equipment and technology for conducting these operations is a primary task. Nevertheless, work done in the scientific research institutes and experimental design offices is still not effective. Some lifting units developed by the Azerbaijan Scientific Research Institute of Oil Machine Construction which are distinguished by higher lifting capacity and degree of mechanization of the main and auxiliary processes for well repair were inefficient. Thus, units KOR0-80 and KOR0-50 received by the Glavtyumenneftegaz were not used while the oil workers of West Siberia are experiencing an acute need for units with lifting capacity of 80 T to guarantee high productivity of the major well repair brigades and reduce the idle fund. This is important because West Siberia cannot count on an increase in the brigades because of limited human resources.

Thus, Glavtyumenneftegaz has to resolve the following questions for improving the oil field equipment:

1. Accelerate completion of development of domestic hydraulic piston units and begin their series production.
2. Include pumping jacks for operation under northern conditions into the plans for series production.
3. Develop the transportation vehicles and start producing them to deliver superblocks of cluster pumping stations to the installation site.
4. Begin manufacture of head pressure regulators in 1982 for the PPD system.
5. Develop a design of electric dehydrator with output of  $500-750 \text{ m}^3/\text{h}$ .
6. Increase the operating time and reliability of the control and measuring and automatic units for oil preparation units under northern conditions.
7. Develop a normal series of block-set assemblies for commercial-grade oil of varying output in a northern design.

8. Solve the question of creating a set of field equipment in the KhL design and not its individual assemblies.

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## FUELS

### SPECIALIZED EQUIPMENT FOR OIL WELLS

Baku VYSHKA in Russian 6 May 82 p 2

[Article by Sh. Dzhfarov, chief of special design office for design of oil- and gas-producing machines and equipment Neftemash: "The Designer's Aim"]

[Text] If one asks an oilfield worker to express his opinion on the technical level of well equipment or to express his desires on its improvement, I have no doubt that he would talk primarily about deep-well sucker-rod pumps. And the oilfield workers would undoubtedly request that a design be developed so that the pump could operate trouble-free for a long period without requiring repair.

More than three-fourths of our country's wells are being operated with deep-well sucker-rod pumps, the single supplier of which is the Baku Machinebuilding Plant imeni Dzerzhinskiy. And our Special Design Office Neftemash has been called on to solve engineering problems in the field of developing deep-well equipment.

The task of increasing the volumes of oil and gas production in all regions of the country was posed at the 26th CPSU Congress and this requires technical re-equipping of the producing industry. The designers must take a large step forward in re-equipping the fields. This assignment was determined by the Basic directions for the economic and social development of the USSR for 1981-1985 and for the period up to 1990. It contains the line "reduce labor expenditures on maintenance of a single well by 15-18 percent." The problem is very timely and acute. Let us translate this to practical language.

The mean cycles between repair of a well is now an average of 205 days throughout the country. In our republic alone, 105,000 repairs are made annually. Because of shutdowns, we have a shortfall of a considerable quantity of oil and a large number of repairmen and enormous quantities of equipment and materials are required to maintain the wells. Consequently, if the number of repairs in the field is reduced, the national economy will achieve an enormous saving. And how is this to be achieved?

The fact is that the production of sucker-rod pumps was based until recently mainly on manufacture of a cylinder from 2.1 to 6 meters long and a set of steel and cast iron bushings coupled in a common housing. These bushings themselves are also the "sore" spot under production conditions and is the most cohesive part in well operation.



The technology of bushing manufacture requires the use of thin-walled pipe and the given precision is achieved only after 15 machining operations. The metal utilization factor comprises only 0.25-0.3 in this case.

With an annual plan of 100,000 pumps and spare parts for them, the plant imeni Dzerzhinskiy produces two million high-precision bushings. More than 25 percent of the workers and metal cutting equipment are involved in machining them alone and a special section to produce the cutting tools has been created. But, despite this complex, laborious production technique, the cylinders do not guarantee sufficient reliability in operation and most frequently because of shifting of the bushings.

Specialists of our OKB [Special design office], having eliminated the bushing system, have developed a new design of pumps with one-piece cylinders of precision pipes that is simpler and more reliable. This reduces by a factor of 15 the number of pump parts and permits a saving of 50 kilograms of metal in each pump due to complete use of it. More than 300 workers and 150 machine tools previously engaged in machining the bushings are freed.

But the oil workers receive the largest saving. The mean cycles between repair of a well equipped with pumps of the new design has increased and in some regions of the country has reached 350 days. The plant imeni Dzerzhinsky is now planning to produce 25 percent of the total volume of pumps by the new design and technique and to convert completely to the new design by the end of the five-year plan.

The plans of the 11th Five-Year Plan envision extensive introduction of the progressive method of gas-lift operation of wells. The first place of the gas-lift method of oil production is the Baku oilfields. After Soviet authority was established during the years of the civil war, it was developed and occupied the dominant position at Baku, Groznyy and other oil regions. However, the need for considerable capital investments for construction of compressor stations and the large specific consumption of gas gradually forced this method out. The task of restoring the gas-lift method of well operation has now been posed to the designers and on the basis of modern advances of science and technology to provide new designs of equipment with minimum consumption of capital expenditures, gas and metal.

The collective of our OKB managed to create a gas-lift complex of a new model and to eliminate the deficiencies of this method and fully realize its advantages. During the course of this work the workers of our office received seven inventor's certificates for inventions that guarantee higher equipment operating indicators compared to the best foreign models. The complex can be used on land and at sea under different climatic conditions with high efficiency. It is easily automated and is reliable in operation.

Despite the fact that the complex of gas-lift equipment could be related more to an instrument building article, the Machine Building Plant imeni Dzerzhinskiy has successfully organized serial production and is producing it with the Emblem of Quality.

More than 800 of the country's wells in Azerbaijan, on Sakhalin Island, in Kazakhstan, Tyumen' and Turkmeniya are producing oil by the gas-lift method. And 3,000 tons of pipes have already been saved by this stock alone and 225,000 cubic meters of compressed gas is being saved daily.

The need of the national economy for this progressive form of equipment is not yet being satisfied; therefore, new capacities that exceed tenfold the current capacities in production of gas-lift equipment must be created during the forthcoming reconstruction of the plant imeni Dzerzhinskiy. With its completion alone, the machine builders will be able to guarantee the demands of the oil and gas industry and will help to fulfill the task posed by the 26th Party Congress--provide 20 percent of oil production by the gas-lift method.

The modern level of management requires orientation toward the consumer. The interests of customers is the compass in the work of the collective of our OKB. Development of equipment is now going on at an accelerated pace for accelerated assimilation of the Western Kazakhstan oil and gas fields, which contain hydrogen sulfide and carbon dioxide. Under these conditions equipment is required which will protect the environment and will remain resistant to corrosion. And even during this year the Kazakhstan oil workers will receive from us 20 sets of equipment from relatively inexpensive marks of steel, resistant to aggressive components.

We are developing different types of equipment for gas wells at the Astrakhan, Orenburg and Turkmen fields and are solving timely problems related to reduction of oil production losses, prevention of open gushers and fires and environmental protection.

The OKB has inventor inspection groups in the country's leading oil regions. They teach the oil workers to service the new equipment and at the same time inform us of which assemblies require improvement. This two-way communications is very important. For example, the OKB initially developed gas-lift equipment for vertical wells and sloping wells now predominate at Tyumen'. Equipment for sloping wells was developed and turned over with excellent results at accelerated rates at the request of oil workers. Further, the oil workers of remote regions, operating under conditions of no roads, desired that the well pumps for them were produced from thick-walled precision pipe since thin pipe fails rapidly. Their request was also taken into account.

The program of work which the collective of the OKB is conducting will permit the Machine Building Plant imeni Dzerzhinskiy alone to double the volume of equipment production.

Unfortunately, complete conversion to serial production of improved designs of deep-well equipment, we feel, is being delayed due to the lack of preparedness of the plant imeni Dzerzhinskiy. The level of technology does not completely correspond to the new tasks: production is being carried out on a general-purpose stock of machines, whereas special machine tools and equipment are required. Solution of these problems by Soyuzneftemash and the union organizations would help to more rapidly remove obsolete designs from production.

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## FUELS

### NEW OIL FROM OLD WELLS

Baku VYSHKA in Russian 8 May 82 p 1

[Article by T. Gasanov, foreman for oil and gas production of NGDU imeni 26 Baku Komissars: "Ton for Ton"]

[Text] Almost two years ago the collective of our brigade of the fourth field of NGDU [oil and gas production administration] imeni 26 Baku komissars supported the call of the brigade of the Shirvan foreman for oil and gas production Aliyulla Nasirova, who decided to organize a competition for more complete use of oilfield reserves under the slogan "Maximum yield from each well." And now, looking back, you can see that much has been done.

Oil production in the section is increasing from year to year despite the fact that most of our 134 wells are the same age as the first five-year plan. Whereas in 1980, when we were awarded the prize in the All-Union socialist competition, the brigade extracted an additional 122 tons of oil above the plan from the interior, the above-plan production will comprise 165 tons in 1981.

It must be said that the main service in this are our operators and veterans of the oilfield Guseyn Alekperov Leonid Kargin, Timofey Zaytsev, Magerram Maksutov, Ashraf Ragimov and others. They are achieving high results daily with persistent work on the stock of wells.

For example, we are supposed to implement 12 geological engineering measures monthly according to the plan but in fact we are implementing more of them. Ten additional measures with a total saving of approximately 20 tons of oil were implemented last month alone in complicated wells.

I note that the nature of our wells is so complex that one cannot always immediately select the "key" for them. Take well 3137. When it stopped producing fuel, many in the shop assumed that the casing string had broken and that the appropriate measures would have to be taken. We in the brigade already knew from experience that metal scale (our bed liquid is very aggressive and corrosive and the pipes rust up rapidly from it) was blocking the path of the oil. We insisted that the well be flushed with aerated fluid and we were right. It is now operating in essentially its former mode, producing 5-6 tons of oil per day.

The creative use of progressive equipment and technology plays an important role in the struggle to increase oil production. Besides traditional measures such as, let us say, changing the depth of submergence of the pump, the length of the run and the number of oscillations of the arm and perforation and re-perforation of the filters, we are also using new measures. For example, we are using vibration-impact action on the bottom zone, which was recently accomplished with good result in well No 3185.

Under conditions where forced pumping of liquid from the beds is required, electric submersible pumps have given a good account of themselves. We are expanding their use from year to year: nine wells are now equipped with them and we are thinking of starting yet another well up in the near future.

We have thus willingly begun to introduce this equipment because new designs of electric submersible pumps are now equipped with reliable control stations which operate essentially trouble-free. I note that although maintenance of the units should be carried out by a special service, many of our operators who have been trained are coping with this excellently. Timofey Zaytsev is doing this especially well. Now in extreme cases--leaks in the pipes or during replacement of a connecting pipe, we can rapidly shut down the electric submersible pump and then start it up again.

We have introduced many other innovations recently in our section. The new designs of deep-well pumps with so-called sprayed pistons are providing an especially good result. We have been operating for the second year now with them in wells Nos 3002 and 3104 and have achieved an increase of their service life by 20 days compared to ordinary deep-well pumps.

Or take another example. An important problem for us is to prevent salt deposits in the pump-compressor pipes, due to which they fail rapidly. Quite recently, to prevent this phenomenon, we successfully used a magnetic device developed by Dzhabad Agalarov, a worker of AzNIPIneft' [Azerbaijan Scientific Research and Planning Institute of Oil], in well No 1265. It permitted an almost threefold increase of the service life of the pump-compressor pipes. Another device developed at the same institute--armatures of the insert type which can be replaced without shutting down the well to remove the pipe--also became a great help in our work.

We have generally adopted the most diverse measures for reliable operation of underground equipment. Besides special protector couplings, which double the service life of sucker-rods for deep-well pumps, we recently began to use special metal nipples manufactured through our own efforts in the workshops of our NGDU. They are installed in the most crucial part of the pump-compressor pipes--in the coupling connection. As a result the mean cycles between repair of the wells where they are being used has been increased by an average of 7-8 days.

Thus, although our wells are becoming older with each year and although their operating conditions are becoming more complicated, we have managed during this year alone to increase the average cycles between repair by almost 24 hours compared to the planned period. I feel that this is a good result

which guarantees us a further increase of oil production and fulfillment of the adopted pledges--to extract 70 tons of "black gold" from the interior above the plan.

However, we do not plan to rest on our laurels. Being guided by the instructions of Comrade L. I. Brezhnev to increase production efficiency and work quality, contained in his speech at the 17th Congress of Trade-Unions, we are full of resolve during the second year of the five-year plan and will subsequently seek out and put into operation new reserves in order to make a strong contribution to strengthening the country's fuel and energy complex.

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## FUELS

### SHORTFALL IN OIL PRODUCTION

Baku VYSHKA in Russian 25 Apr p 2

[Article by I. Akhmedov, operator for oil and gas production, G. Mamedov, chairman of head group of peoples' control, NGDU Shirvanneft', and S. Garayev, special VYSHKA correspondent: "Apply All Efforts to Increasing Oil Production"]

[Excerpts] The oil workers of the republic adopted the pledge to produce 15,000 tons of oil and 185 million cubic meters of gas above the plan for the second year of the five-year plan. How is this pledge being fulfilled?

The leading collectives, among which are such NGDU [oil and gas production administration] as Muradkhanlyneft', Ordzhonikidzeneft', Azizbekovneft', imeni 26 Baku Komissars, Leninneft', have successfully completed the plan of the first quarter and have entered the first hundreds of tons of oil above the plan to the account of fulfilling the pledges. The Muradkhanly oil workers, who are exploiting the promising field in the middle course of the Kury River, have achieved especially high indicators--they have already extracted more than 4,000 tons of liquid fuel from the interior above the plan.

However, the situation with oil production in the republic is extremely intense on the whole. The collective of the All-Union Industrial Association Kasporneftegazprom worked especially unsatisfactorily during the first quarter. Of the two production associations and four NGDU contained in the VPO [All-Union industrial association], the associations imeni 22nd CPSU Congress, Chelekenmorneftegazprom and the NGDU Artemneftegaz coped with the plan and they did not produce a single ton of above-plan fuel with the exception of Chelekenmorneftegazprom. And the offshore oil workers promised to produce 10,000 tons above the annual task.

The association Azneft' also did not fulfill the production plan. Its collective is almost 12,000 tons of "black gold" in debt to the country. The oil- and gas-producing administrations Shirvanneft', Kirovneft', Sal'yanyneft', Neftechalaneft' and Siazanef't' are in great debt.

Things are different with gas production. The plans and pledges here are overfulfilled.

Some of the main reasons for the lag in oil production are the unsatisfactory work of many collectives of the oilfields and NGDU on the stock of wells, the

low efficiency of implemented geological engineering measures and the weak introduction of secondary and tertiary methods of intensification of production. There are cases when some managers, instead of mobilizing the efforts of the oil workers to control deficiencies and omissions in work and for maximum utilization of available reserves, are talking about the unrealistic nature of the plans.

#### There are Reserves in the Oilfields

To produce 450 tons of oil and 400,000 cubic meters of gas above the plan are the positions of the collective of NGDU Azizbekovneft' for 1982. They were determined by the status of the oil and gas pool in the Kala and Buzovny areas where "black gold" has been produced for 50 years now. The yield of the old fields has diminished. But the creative energy of the workers and specialists whose efforts are directed toward thriftiness and complete utilization of available production reserves, has not waned.

"The first quarter of this," says the chief engineer of the administration A. Mamedov, "was hard due to weather conditions. And nevertheless the collective coped successfully with the plan and adopted pledges. It produced 100 tons above the plan instead of the 90 tons of fuel. The pledge for gas production was overfulfilled severalfold. The thoughtful work on the wells and implementation of effective measures contributed much to this.

Well No 1091, for example, frequently "had the blues" and yielded only one ton of oil per day. Only after a series of investigations in different modes carried out at the recommendation of the senior geologist of the oilfield A. Gasanov, were we able to determine its potential capabilities. It was decided to increase the submergence of the pump-compressor pipes. As a result the yield of the well increased by two tons of oil per day. The consumption of compressed air was considerably reduced in this case.

Work to increase the oil yield of the bed on the section is combined with intelligent use of internal capabilities. The oil is periodically pumped counter to the iron seals here. This prevents clogging of the pipes, due to which the wells stand idle for a long time in repair.

Thriftiness and a managerial attitude toward the national good in the field are manifested by many workers. Unsuitable sucker-rods are used as ground piston rods after slight refinishing. Here mechanic K. Abbasov, fitter Akif Aligyul' and operators B. Aydamirov and I. Rzayev restore unsuitable slide valves.

At the suggestion of specialists of this field, the entire system of oil collection and transport was improved considerably. This made it possible to reduce the single oil-collecting station, to eliminate losses and also to save 10,000 running meters of large-diameter pipe. So-called vertical settling tanks, which are manufactured from drawings of a group of specialists of the administration, are being installed to replace the failed Lobkov settling tanks at the existing oil collecting station. Their advantage is that gas is completely trapped while oil and water are separated automatically. In this

case pure oil is sent to a container without additional treatment, which has a positive effect on the quality of the released oil.

The secretary of the shop party organization, geologist L. Yefimov, acquainted us with interesting data. By converting the wells from compressor to deep-well pump method of operation, they managed to free hundreds of meters of pipe very much needed by the oil workers and to achieve an annual saving of compressed air of 100,000 cubic meters. The intensive labor of foreman I. Aliyev, N. Safiulov and operators A. Agadadashev, Dzh. Salimov, A. Vasil'yev, G. Zuzy and Dunyamaly Kurbanshakh ogly, which combines a high feeling of responsibility for economical use of reserves, is behind these figures. And this is directly felt in the final results. Already during the Jubilee Year the oilfield sent 136 tons of oil for refining above the plan.

"We are trying," says the chief of shop No 3 for oil and gas production S. Akhundov, "to consolidate and develop our success. The repair workers can and should render us great assistance in this. But not all brigades are staffed with people who are well-supplied with the corresponding equipment and technology and this seriously delays the rates of repair of wells."

We managed to hear the same thing at the fourth field, where an intense situation has developed. The fact is that a number of wells, among which were high-yield types, failed here in February. This was immediately felt in fulfillment of the state plan. True, the vigorous efforts of the brigade of foreman V. Koshel' and the engineering support of specialists of the worker initiative made it possible to make up the existing debt in March. But still the collective was unable to fulfill its quarterly pledges.

"And we could have," says the senior geologist of the field Ye. Furtsev, "if, for example, high-yield well No 806 had been restored in time. But it has been in operative for one and a half months now."

The section for capital repair of wells of the NGDU is divided into two groups --the Kalinskaya and Buzovninskaya. But whereas the repairmen of the Kalinskaya group are coping with the plan and pledges, the repair workers in the Buzovninskiy section, which combines the third and fourth fields, are thoroughly lagging behind.

True, much has recently been done at the NGDU to improve the work of the repairmen. Last year, for example, the group of workers of the administration visited the NGDU Arlanneft' (Bashkiriya), where they studied the work experience of the repair brigades by the so-called nondetail system. The first steps have already been made. Regulations have been worked out on introduction of this system and much organizing work has been done in the fourth field, where it is planned to convert to the detailless system of seven brigades of underground repair wells in May. According to preliminary calculations, introduction of the new system of organization and payment of labor will make it possible to reduce the idle times of wells and to increase their mean cycles between repair. The wages of the workers will be higher than existing wages provided the established norm is fulfilled.



## Overcome the Lag

Let us say immediately that the collective of NGDU Shirvanneft' began the second year of the 11th Five-Year Plan unsuccessfully. In January alone, it was in debt to the government for about 8,000 tons of oil, whereas it promised to produce no fewer than 3,000 tons of liquid fuel above the annual plan in the socialist pledges adopted for 1982. The total debt for the first quarter comprised 7,300 tons of oil.

What was the cause of this situation and could it be assumed unexpected for the collective of NGDU Shirvanneft', which has confidently achieved stabilization of the production level in old fields for several years? The chief of the NGDU V. Mamedov answers this question as follows:

"A sharp drop of bed pressure occurred during the last months of last year at the new Mishovdag section. We were forced in this regard to convert all gusher wells of the section to the mechanized method of operation. Much time was required for this, which was also reflected in fulfillment of the plan and pledges for this year.

We justifiably note that there are also other objective reasons that explain the lag, such as, for example, the extensive flooding of the Severnyy Kyurovdag field, the severe paraffin deposits in the wells on the area of the Central Kyurovdag and the low yield of wells achieved from drilling. Last year, for example, the average yield for new wells comprised 8.2 tons compared to the planned 13.2 tons. In other words, the oil production plan by the category of new drilled wells was realized by only 68.1 percent and the shortfall comprised approximately 22,000 tons.

But it would of course be untrue to explain the lag of the collective of the NGDU only by objective factors not dependent on the oil workers. Extensive reserves for intensification of production remain unutilized due to the lack of organization of repair work in the fields. Although the collective of the shop for capital and underground repair of wells of the NGDU overfulfilled the quarterly task, there are still many lagging brigades here. Because of them, 19 wells from which an important addition to the daily production was expected, were not put into operation in the administration.

Brigades supervised by foreman F. Salimov, M. Imanov and A. Abdullayev, whose quarterly tasks were fulfilled by 28.5, 37.1 and 60.0 percent, respectively, worked considerably below their capabilities. And the brigade of foreman Sh. Mustafayev had an accident in performing underground repair of well No 118. A total of 24 repeat repairs and two cases of rejection has been recorded since the beginning of the year in the shop, which led to a large shortfall of oil.

Because of the absence of a work force, shortages of equipment and tools and also through the fault of the transport workers, more than 1,200 brigade-hours were lost in the administration. For example, the repair unit of the mark Bakinets was idle for more than 24 hours the other day while awaiting an operator at well No 827 of the Severnyy Kyurovdag area. According to the most modest calculations, the brigade of the well-known foreman, initiator of

the republic competition of oil workers under the slogan "Maximum yield from each well" A. Nasirov lost five tons of fuel. The same thing was repeated at well 707 and some others.

Of course, the collective of the NGDU is not coping with the established situation. Regardless of the field or section that we visited, a persistent search for new reserves for stabilization and increase of production is now under way in the administration. As a result 300 tons was produced above the plan in February and 521 tons of oil was produced above the plan in March.

The rates of production increased even more in April. Development of new wells obtained from drilling and also putting two inactive wells into operation with daily yield of up to 70 tons of pure oil contributed largely to this.

The participants of the raid visited the second field.

"We," says the chief of the third section Beyukkishi Veliyev, "managed to overcome the drop in production. Success was achieved by intensification of work on the stock of wells. An especially joyful event for the brigade was putting well 492 into production, which produced oil from the 15th horizon of a productive bed for the first time in our field."

Great labor enthusiasm predominates at the first section of the field. Well No 395, which produces 50 tons of oil per day, was started up here the other day after a long idle time.

"This is a very good mark for us," says the foreman of the section Yagub Kurbanov. "Well No 795, where cutting and drilling of the second column is under way, will soon be operational."

And at the fourth section foreman F. Gambarov and operators S. Agayev and K. Farzaliyev reported to us that well No 442 has just become operational with good yield after completion of insulation work.

The indicators achieved in February and March and also the current purposeful work of the Shirvan oil workers give reason to hope. However, they must labor even more vigorously and creatively and persistently put ever newer and newer reserves into operation to honorably fulfill all items of the pledges taken in honor of the 60th anniversary of the formation of the USSR.

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CSO: 1822/182

EXPERIMENTAL BURNING OF LEAN KAVAKSKIY LIGNITE IN FORM OF WATER-COAL SUSPENSION

Frunze IZVESTIYA AKADEMII NAUK KIRGIZSKOY SSR in Russian No 6, 1981 (manuscript received 6 Feb 81) pp 9, 93

[Article by G. V. Koz'min, A. K. Dzhundubayev, G. N. Delyagin, F. T. Kashirin and V. I. Borzionova, Institute of Geology, Kirgiz SSR Academy of Sciences, and Kirgiz Scientific Research Department of Power Engineering]

[Excerpts] The results of bench tests, tests on burning Kavakskiy lignite in the form of a water-coal suspension (VUS) with moisture content of  $W^P = 50$  percent are presented in the article. The possibility of organizing a stable combustion process of a dispersed water-coal suspension in an airflow without thermal stabilization of the burner was studied. The limiting modes of the stable combustion process were established under conditions of an uncooled combustion chamber of the experimental installation. It is suggested that an experimental industrial test of this method on an existing boiler unit be carried out to determine the operating parameters of the process of burning a water-coal suspension of Kavakskiy coal in the furnaces of a thermoelectric power plant.

Conclusions

1. Experimental investigations on burning a water-coal suspension of Kavakskiy lignite were carried out. The possibility of organizing a stable process of burning a dispersed water-coal suspension in an airflow was established. A high degree of fuel burnup ( $b = 0.98-0.99$ ) with air loss coefficients in the range of 1.03-1.11 was achieved.

2. It is shown that overconsumption of fuel, related to the need to evaporate the moisture of the fuel in the boiler burner and to compensation of the reduction  $\epsilon_{br}$  of boiler units when burning suspensions of Kavakskiy lignite, is totally made up by reducing the coal losses in the stages of transport and fuel preparation at an electric power plant operating on the coal dust scheme.

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## FUELS

### COAL MINE AUTOMATION EXAMINED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 May 82 p 2

[Article by Hero of Socialist Labor V. Antipov, general director of Scientific Production Association Avtomatgormash, and V. Il'yushenko, chief engineer of Mine imeni A. F. Zasyad'ko, Donetsk]

[Text] Is automation required in mines? This problem may appear to be rhetorical at first glance. There is hardly anyone today who would risk giving a negative answer to it. At least in words. But in fact? Specialists talk about what is happening in a different manner with automation of underground mining complexes.

More than 1.5 years of continuous operation of a mechanized complex, more than 900,000 tons of mined coal, including 180,000 tons above the plan, more than 300,000 rubles saving are the results of working the eighth western longwall of the Donetsk mine imeni A. F. Zasyad'ko since September 1980 up to the present. There is the basis to assume that the KM-87DGA complex will operate in this longwall at the same rhythm for several more months until the coal reserves at the face are exhausted.

Before going on to the eighth western longwall, the same collective finished work in another--the seventh western longwall of the same seam. They say that there are two identical longwalls but in the given case the coincidence is almost total: the same mining and geological conditions, the same thickness of the seam and the identical length of the longwall--200 meters, and the same people in the brigade. There is only one difference: the coal at the seventh longwall was mined by the KM-87DN complex which has timbering with manual control, while the coal at the eighth longwall was mined by the KM-87DGA complex with automated timbering. Let us now present some numerical data for comparison. The average monthly production at the seventh longwall comprised 38,000 tons during a year of its operation, while production at the eighth longwall comprised 49,000 tons. The face was moved by 55.9 and 71.8 running meters, respectively, during a month.

Regardless of how eloquent these comparisons are, miners see the main advantage of automated timbering in a quite different light: automated timbering sections move without loss of contact with the roofs of the face and the

"upper part" is not separated from the roof for a minute. And this means that the roof at the longwall is continuously and reliably supported by DGA timbering and collapses are essentially reduced to a minimum. Hence the even, rhythmic work and increase of production.

You cannot call the DGA automated timbering an innovation--it was first used in the Donbass as early as 1974. But even then it showed its best aspects. Another thing is typical: during these seven or more years the Druzhkovo Machine Building Plant imeni 50-letiya Sovetskoy Ukrainiy manufactured only 11 sets of this timbering. Only one set was made during 1980 instead of the planned five and last year not a single set was made with the same task. It is amazing that the miners of the mine imeni A. F. Zasyad'ko who work with only one set of DGA timbering, which was produced at Druzhkovka in 1980, are now sounding an alarm. The operating life of the existing timbering will soon be exhausted and the set will have to be sent for repair and what will there be to work with later at the new longwall?

Perhaps, there is no sufficient front of application for automated timbering? No, this is far from true. There are approximately 60 thousand-ton longwalls in the mines of the Ministry of the Coal Industry of the Ukraine in which automated timbering can and should be used. And they, with the appropriate attitude toward them, could guarantee the same increase of production and could operate just as efficiently as at the Mine imeni A. F. Zasyad'ko. It is appropriate here to present yet another figure: if the annual saving at a single longwall named by us comprises 200,000 rubles, then this will yield no less than 10 million rubles for 60 longwalls.

But why must one be concerned about a good matter? It would seem that the advantages of DGA timbers are so obvious that it should receive a "green light." However, things are quite different in reality. Even the miserly planned tasks, compared to the requirements, which the Druzhkovko plant receives on production of progressive timbers are systematically not being fulfilled. And a specific ritual of refusal to produce leading equipment has already been worked out.

The production association for coal mining has received an order for automated timbering. It is put into contact with the plant in order to refine the delivery deadlines: after all, timbering has usually already been designed for a specific shaft and for a specific longwall. The plant politely answers: there are no timbers and there will be none within the deadline that you require. They suggest replacing the timbers with another nonautomated type and we need only write a letter to the plant. Of course, they write the letter (what else can they do) and "at the request of the customer" the necessary timbers are replaced by less modern timbers. And the plant is in no way guilty--the customer himself requested it.

We are far from the idea that this situation was caused by some special antipathy of the Druzhkovko plant workers to the given article. The machine builders themselves at a recent executive meeting devoted to the use of DGA timbers proceeded through their representative as follows: "To manufacture this same automated timber would require expenditure of 46,500 norm-hours,

that is, 26,000 more than for ordinary timbers, while it is 55 percent cheaper."

So then this sounds convincing if not, if not for one circumstance: the figures presented to the plant representatives, to put it mildly, are not accurate. It is unknown what was meant by the word "ordinary" timber but if one takes the KM-88 or 2-MKDM timbers serially produced by the plant and similar in characteristics, but not automated, then the number of norm-hours expended on their manufacture is equal to 30,000 rather than 20,000!

Obviously, the reason is elsewhere. Of course, it is easier and more advantageous to make tens and hundreds of sets of timbers by a long-developed technique that is simpler and less efficient than to manufacture five sets of automated timbers annually. Possibly, the plant would also willingly take on manufacture of DGA timbers if the order were stronger and more advantageous. But after all, besides the plant interests, there are also statewide interests and they preemptorily dictate the need to introduce automation which will contribute to transition of the coal industry to non-human digging of coal.

Of course, the foregoing does not mean that the DGA automated timber is absolutely perfect. It has some design deficiencies on which the designers are now working to correct. But its advantages clearly outweigh the disadvantages. I would like to present here the opinion of a person who is quite competent--brigade leader of Mine imeni A. F. Zasyad'ko Ivan Fedorovich Manekin: "Our brigade has been working at the longwall equipped with KM-87DGA automated timbering for two years now. Control is group and automatic. By pressing a button, the operator mainly only observes the work of the timbering machinery. We produce an average of 1.875 tons of coal instead of the 1.543 planned in 24 hours from a seam 1.3 meters thick. Our miners are thankful for the fact that we have named it the "miracle-timber." To return to non-automated timbers means nothing other than taking hold of the pick and shovel. There are wishes concerning improvement of the design of the cutoff valves of the control unit and with regard to spare parts. But the main thing is why are there so few of these timbers here?"

One can fully sympathize with the confusion of the brigade leader, which incidentally is shared by many workers of the coal industry. The word here is primarily Soyuzuglemash [expansion unknown] of the USSR Ministry of the Coal Industry. The decisions of the 26th CPSU Congress persistently require extensive introduction of automation and further mechanization.

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CSO: 1822/181

## FUELS

### NOVOKUZNETSK COAL OPERATORS REPORT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 May 82 p 1

[Article by V. Kladchikhin: "The Miners Control the Tempo"]

[Text] The brigade of meritorious miner Yu. Kozlov from the Novokuznetsk mine Bol'shevik celebrated Mayday with a record in cutting mines. The collective was the first at enterprises of the RSFSR Ministry of the Fuel Industry to pledge to surpass 1,000 meters of underground drifts per month and kept their word three days ahead of schedule.

By tradition the miners of the Kuzbass not only voluntarily participate in the All-Union Lenin Communist Subbotnik, but also announce all of April as days of a Leninist shock watch. During the first day of the month-long period, the leading brigade began to work on an accelerated schedule. The section of Yu. Sirotin distinguished itself, which covered 26 meters per shift. Yet another record was recently established: 72 meters were driven in 24 hours. Thus the final result is made up of the daily shift achievements.

Here is an interesting comparison: before assimilating the new technique, the brigade of Yu. Kozlov was required to drive a kilometer by the drilling-explosive method in no less than a year. The new rates became possible due to borrowing the experience of the best driving collectives of Vorkuta, Leninsk-Kuznetsk and adjacent mines. It was possible on this basis to newly organize delivery operations in driving, to mechanize almost all the auxiliary operations and to introduce a number of interesting engineering solutions. As a result the labor productivity of each miner exceeded the planned productivity by three meters per month.

In assimilating the technique, recent graduates of vocational-technical schools and fellows who have returned from the army vitalize the brigade. In the opinion of veterans, Gennadiy Vlasov, who was an understudy to tutor V. Shadrin, gave a good account of himself. Among the suppliers, Valeriy Konontsev, who studied the skills of cutting-loading machine operator G. Slizevich, was transferred to the brigade. Apprenticeship has become the most valuable path to foreman in the brigade.

As was planned, driving is being conducted by a progressive two-face method. The miners of Bol'shevik sharply changed their technical policy during the 11th Five-Year Plan and converted completely to mechanized preparation of the coal reserves and mining of them.

This year the volume of production in the mine will exceed one million tons of fuel. The future plan for technical development, worked out by specialists of the enterprise, envisions a further increase of capacities. This plan can be implemented primarily by the drivers.

The first quarter plan was fulfilled 10 days ahead of schedule and 270,000 tons of coal have been shipped to consumers since the beginning of the year. The high-speed brigade of Yu. Kozlov produced more than 15,000 tons of the coal.

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## FUELS

### BRIEFS

OIL PRODUCTION--The first tons of oil were produced from the five-kilometer well in the Eastern Barsa-Gel'mes field in Turkmeniya. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 17, Apr 82 p 3] 6521

GAS-LIFT METHOD--The first complex for producing oil by the so-called gas-lift method became operational at the Fedorovskaya field, Tyumenskaya Oblast. Its essence is that the gas which is produced here together with oil is again pumped into productive horizons. A liquid then forms a foam, thus helping to raise the gas through the well. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 17, Apr 82 p 3] 6521

NEW COMPRESSOR STATION--SURGUT, Tyumenskaya Oblast--The oilfield workers of the Fedorovskaya field are increasing oil production without introduction of new wells. The first complex for producing raw material by the so-called gas-lift method was put into permanent operation here yesterday. A powerful compressor station and system of pipelines that connect almost 100 wells to the station has entered the Fedorov complex. Conversion to gas lift will help to improve the exploitation of the field. [Text] [Baku VYSHKA in Russian 15 Apr 82 p 1] 6521

DEEP PRODUCTION--ASHKHABAD--The first tons of oil were produced today from the five-kilometer well at the Eastern Barsa-Gel'mes field. Exploitation of the deep horizons is an important reserve for development of the petroleum industry of Turkmeniya. Exploration of the reserves at depths of 5,000 meters or more is intensively under way. [Text] [Baku VYSHKA in Russian 15 Apr 82 p 1] 6521

MG-3500 MOTOR-GENERATOR--The MG-3500 motor-generator developed by the Plant Russkiy Diesel and VNIIGaz [All-Union Scientific Research Institute of Gas], is designed for installation at electric power stations of self-needs of gas pipelines and fields and also to provide cities and villages located in the immediate vicinity of facilities of the gas industry with electric energy as a main and reserve source of power. The gas motor-generator consists of a two-stroke 16-cylinder gas engine with supercharging and countermoving pistons with rating of 3,677 kW at 710 rpm and an electric generator with exciter of the Elektrosila Plant. Agency tests after three years of successful trouble-free operation were passed successfully. The specifications are nominal rating at the output buses of the generator--3,500 kW, maximum temporary output (for one hour)--3,850 kW, mean cycles between repair--8,000 hours, rotational frequency of generator shaft--1,000 rpm, voltage--6,300 volts, amperage--404 A, current frequency--50 Hz, type of current--three-phase alternating, mass of engine--39 tons, mass of generator with exciter--20 tons and

mass of water and lubrication unit--10 tons. The use of an improved fuel combustion process permits a working process with high efficiency. The service life of the engine has been improved by a factor of 1-5 and the service life of the oil has been increased. The use of gaseous fuel instead of diesel fuel under arctic conditions, notes VDNKh [exhibit of achievements of the national economy] of the USSR, permits a considerable reduction of expenditures for fuel and lubricating materials. [Text] [Moscow ZHILISHCHNOYE I KOMMUNAL'-NOYE KHOZYAYSTVO in Russian No 12, Dec 81 p 40] 6521

GAS PRODUCTION--Kirov--Tyumen' gas has been delivered to the housing tracts of the city: a gas pipeline has been laid from the Tyumen'-Genter trunk to Kirov. Enterprises and residents of Kirovo-Chepetsk, Novovyatsk and Vyatskiye Polyany will receive Siberian fuel during the five-year plan. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 26 Jan 82 p 1] 6521

ELECTRIC MOTORS--The collective of the Kutaissy Electromechanical Plant shipped a routine lot of new heat-resistant submersible electric motors to the oil workers of Western Siberia. The producers achieved an appreciable saving of metal in producing these mechanisms due to a number of interesting engineering solutions, born in cooperation with the Kutaissy designers and technicians of submersible electric motors. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Apr 82 p 1] 6521

KARAKUMY PRODUCTION--A new region of gas production was opened in Eastern Turkmeniya. Gas was produced from a well almost three kilometers deep in the area of Chertak in the Karakumy. It is planned to bring production of gas in the republic up to 81-83 billion cubic meters during the 11th Five-Year Plan. Ten new wells will have to be developed to do this. [Text] [Moscow PRAVDA in Russian 7 May 82 p 2] 6521

GAS PIPELINE EQUIPMENT--L'VOV--The designers of the L'vov Scientific Production Association Termopribor developed the Gradusnik for the gas pipelines. It measures temperatures with high accuracy in the range from -50 to +150°. Continuous monitoring of the gas temperature in steel trunk lines is necessary to prevent formation of ice plugs in the pipes, to avoid overheating of the fuel and to maintain the most economical mode of transporting it. Serial production of these meters has been entrusted to the Lutsk Instrument Building Plant. [Text] [Moscow GUDOK in Russian 7 May 82 p 1] 6521

SOCIALIST PLEDGES--TBILISI--The collective of the production association Gruzneft' reported fulfillment of the socialist pledges in honor of May Day yesterday ahead of schedule. A total of 5,000 tons of valuable raw material above the plan has been produced since the beginning of the year. New prospecting wells are being laid now in the east and west of the republic to determine the reserves of raw material located in deep underground storehouses. Georgian oil is already calculated at million of tons annually. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Apr 82 p 1] 6521

DIESEL MOTOR SHIP--MURMANSK--The diesel electric ship "Valentin Shashin"--the first of a series of ships designed to conduct geological prospecting operations in the Arctic, is ready for its voyage. It is supplied with special equipment that permits drilling deep wells in coastal regions. The need for

these ships was caused by expansion of the geography of the regions under study, it was reported to a TASS correspondent at the Ministry of the Gas Industry. The "Valentin Shashin" is a ship of reinforced ice class. And there is yet another feature--this diesel-electric ship can remain over the drilling point even in high seas. A drilling rig which permits prospecting of the interior at sea depths up to 300 meters is located on its deck. Ships of offshore oil and gas fields have the most diverse "occupations": among them are geologists, fitters, transport workers and floating hotels. The motor ship "Sprut," recently put at the service of the offshore oil and gas producers, is equipped with a deepwater complex which permits divers to work at great depths. They can perform some operations on underwater equipment or on pipelines by means of manipulators. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 11 Apr 82 p 2] 6521

NEW FLOWMETER DESIGN--A new flowmeter design for recording the flow of gas in trunk pipelines has been developed at the Chair of Hydraulics and Hydraulic Machines, Odessa Polytechnical Institute. These devices are much less expensive and more reliable than their predecessors. An experimental lot of the first flowmeters, which will find broad application on the Urengoy-Uzhgorod and the Western Siberia-Center gas pipelines, will be manufactured this year at the Saratov Plant Gazavtomatika. [Text] [Kiev PRAVDA UKRAINY in Russian 25 Apr 82 p 2] 6521

GAS PRODUCTION BY GAS LIFT--SURGUT--The oilfield workers of the Fedorov field are increasing oil production without introduction of new wells. The first complex to produce raw material by the so-called gas lift method went into permanent operation here a few days ago. Its introduction was determined by the decisions of the 26th CPSU Congress. The essence of the method is that gas energy is used to extract raw material from the interior. It is achieved in co-production with oil. The gas is separated on special installations and is again pumped under pressure to the productive beds. The gas foams the oil, thus assisting it to rise through the well. Unlike traditional pumps, this "pump" tolerates elevated temperatures and deposits of sulphur compounds. After all, it contains no moving parts. A powerful compressor station and system of pipelines that connect almost 100 wells to the station has become part of the Fedorov complex. Conversion to gas lift may improve exploitation of the field. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Apr 82 p 1] 6521

WATER ELECTROACTIVATION DEVICE--KOKAND--An installation for electroactivation of water--the UEV-4, produced by the Kokand Plant Bol'shevik--has been successfully operated at the country's gas-producing enterprises. This unit, developed by the Central Asian Scientific Research Institute of Natural Gas in cooperation with plant specialists, is designed for electromagnetic treatment of bed and sea waters used by gas producers in manufacture of drilling mud. It freshens up to 20 cubic meters of water per hour, saving a large quantity of caustic soda and other expensive reagents. The range of application of the Kokand innovation is broad: in the cement industry, in medicine, agriculture and other sectors of the national economy. As indicated by experiments, the strength of cement prepared in electroactivated water is 20-25 percent higher than in ordinary water. The use of this water to treat cotton

seeds has a significant effect. Germination and growth of them are appreciably enhanced. This year the plant collective will ship 50 sets of the new installation to the gas producers of the Far East, Tyumen' and Turkmeniya. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 May 82 p 2] 6521

GAS CONDENSATE PRODUCTION--VUKTYL, Komi ASSR--A pipeline, to construction of which the builders of Glavkomigazneftestroy began, is starting in the Zapadno-Sopleskoye gas condensate field. This transport artery connects the new field to the existing field by the Urengoy-Moscow gas pipeline. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 11 May 82 p 1] 6521

DEPTH MEASURING DEVICE--A new device for measuring the depth of a well has been developed at the Azerbaijan Institute of Petroleum and Chemistry imeni M. Azizbekov. The measuring devices now employed have a number of disadvantages: there is no protection against false marks leading to failures of the main counter, the presence of several interrelated counters reduces the overall reliability of the device and there is no correction for the initial depth. These deficiencies are eliminated in the new device. The main assemblies of the innovation (adder, comparison circuit and counter) are easy to integrate. [Text] [Baku VYSHKA in Russian 11 May 82 p 3] 6521

GAS CONDENSATE DISCOVERY--Tyumen' geologists have discovered a new productive bed of the Transarctic gas condensate field at a depth of 3,360 meters. This mark has been reached for the first time. Tens of oil and gas fields have been discovered in Tyumenskaya Oblast. But in the opinion of specialists, its interior still holds many secrets. The geologists now have a good idea of their structure only to a depth of 3,000 meters. What is beyond this mark is indicated by sinking deeper underground shafts. This year alone it is planned to drill 20 of these boreholes. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 3 Apr 82 p 1] 6521

VUKTYL GAS PRODUCTION--Komi ASSR--The All-Union Komsomol watch of friendship at the Vuktyl gas condensate field has completed a remarkable event. The 200-billionth cubic meter of gas produced since the beginning of operation of the arctic field has been sent to the center of the country. The accelerated development of Vuktyl, which was begun 15 years ago, is an example of the labor heroism of the youth. The gas pipeline was laid from the swampy banks of the Pechora River to the Volga River within record short deadlines. A well-appointed village with schools, kindergartens, a sports complex and dispensary has grown on the spot of the 10th city of the first drillers. Every fifth worker in the arctic field is a Komsomol member. The shock detachment of volunteers began to develop a new gas condensate field adjacent to the Vuktyl Zapadno-Sopleskaya field. The young people gave their word--to begin commercial operation of it next year. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 20 May 82 p 1] 6521

100,000 TONS OF OIL--KAZAN'--The number 100,000 flashed on the electronic board of the chief dispatcher of the Tatneft' Association [Tatar Petroleum Association]. The oilfield workers of Tatariya have produced this much valuable raw material since the beginning of the five-year plan. They will reach this position with surpassing of the schedule. A total of 280,000 tons of

"black gold" above the plan was dispatched to the refining enterprises. The oil workers of the autonomous republic achieve the high level of production due to introduction of the latest methods of increasing the oil yield of the bed, automation of fields and accelerated drilling of new wells. Operation of six new fields has begun since the beginning of the five-year plan. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 20 May 82 p 1] 6521

COAL PRODUCTION--The miners of Baydayevskaya mine reviewed the socialist pledges adopted earlier in honor of the 60th anniversary of formation of the USSR. They planned to fulfill the annual plan by 12 December and to produce 95,000 tons of fuel above the plan. The mine collective was one of the first in the association Yuzhkuzbassugol' to fulfill the three-month program and already has more than 50,000 tons of fuel to its account above the plan. This was achieved due to timely and high-quality preparation of the cleanup front and increasing the load on mining equipment. Thus, the initiators of a competition for high labor productivity at the enterprise--miners of A. Plastunen-ko's brigade--brought the load at the mechanized longwall in a seam with thick coal to 2,000 tons of fuel daily. The brigade of R. Shmidt, which is mining the thin deposits of coal using the 40KP-70 experimental complex, is confidently approaching this position. The driving brigades are not falling behind the producers. The brigades of I. Alchinov and A. Chuvelev are laying underground mainlines at high speed. April was announced as a month of shock labor at the mine. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Mar 82 p 1] 6521

UNDERGROUND MINING--Whereas the collectives involved in open pits produced tens of thousands of tons of fuel above the plan since the beginning of the year, their colleagues working in the mines were in debt by 240,000 tons of coal. And the debt continues to increase since the manager of the association (general director A. Druzhinin) at one time committed serious miscalculations in engineering preparation of cleanup operations. This resulted in a lag with introduction of new horizons at the Komsomol'skaya, Korkinskaya and Tsentral'-naya mines. At the latter of them, the prepared longwall was specifically flooded since they did not pump the water from the upper horizon in time. Because of this, it was impossible to install a mechanized complex. The idle times and emergencies of the complexes have become a customary phenomenon. The complexly mechanized longwall has long been out of order as a result of miscalculation at the same Baturinskaya mine and it is now being restored. A lack of workers of the main mining occupations is also felt: proper attention is not given in the association to vocational training of young workers and to training of personnel in the vocational-technical schools and trade schools. Moreover, the Chelyabinsk workers are building little housing and few social and cultural facilities. The Ural workers are also awaiting greater assistance from USSR Minugleprom [Ministry of the Coal Industry] in restoration of obsolete and physically worn equipment and deliveries of spare parts for driving

and mining equipment. The funds allocated for them by Chelyabinskugol' are clearly inadequate. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Apr 82 p 3] 6521

ELECTRIC POWER IN MINES--The Ukrainian SSR Ministry of the Coal Industry reviewed the article "The Brigade is Seeking Reserves" (PRAVDA UKRAINY, 13 Jan 82). The deputy minister P. I. Marosin reports that energy re-equipping of 250 preparatory faces is envisioned by technical measures during the 11th Five-Year Plan and 140 of them are at mines of the association Artemugol'. However, total conversion of all mines from pneumatic to electric energy is being delayed by the absence of protective equipment, development of which is being carried out by the Institute of Mining imeni Skochinskiy. A total of three cutter-loading machines, five Strela-77 development machines, 169 rock-loading machines and 30 drilling rigs has been allocated to the association Artemugol' for 1982 to increase the labor productivity of cutters and the rates of developing mines. The planning and design institutes jointly with the machine building plants are creating new highly productive machines for hard rock and mines with large cross-section to expand cutter-loader development of mines. The Dongiprouglesh Institute has developed the KRT entry-driving machine, an experimental model of which successfully underwent tests in 1981. The Soyuz-19 standardized entry-driving complex and also an experimental lot of 4PP-2Shch cutters will be manufactured at the Yasinovatka Machinery Plant. The TsNIIpodzemmach Institute together with the Yasinovatka Machinery Plant has developed the 4PP-5 cutter to cut entries along a mixed face and other equipment. The ministry is conducting work to develop new types of timbers and to increase the volume of their use in order to improve the condition of mines. The provision of mines of the association Artemugol' with metal-arched timbers was improved considerably. Thus, 32,100 tons of rolled metal was allocated to the association for 1982 with a need of 31,400 tons. All problems touched on in the article are being reviewed by the ministry. [Text] [Kiev PRAVDA UKRAINY in Russian 12 Feb 82 p 3] 6521

SOCIALIST PLEDGES--KRAMATORSK--Among the socialist pledges of the collective of the association Novokramatorsk Machine Building Plant, adopted in honor of the 60th anniversary of the formation of the USSR, is the following line: "Give the green light to all orders of the fraternal republics." True to their word, the machine builders manufactured and sent to the miners of the Sokolovsko-Sarbay ore enrichment combine a powerful installation for ore enrichment ahead of schedule. Its productivity is almost 5,000 tons of ore per day. This is the 52nd machine with the mark of the NKMZ received by the miners of Kazakhstan. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Apr 82 p 1] 6521

AUTOMATED CONTROL SYSTEM--VOROSHILOVGRAD--The latest advances of science and technology are being actively put into production at enterprises of the coal industry of Voroshilovgradskaya Oblast. Thus, the first unit of the automated production control system Saturn, which provides recommendations for optimum use of the work force and keeps a tabular account, became operational at the Miusinskaya mine of the association Donbassantratsit. Preparation to introduce the Aist and Astra systems, which monitor the operation of equipment at working faces and in underground transport, for introduction is being completed here.

The same systems were installed somewhat earlier at the Vergelevskaya mine of the association Stakhanovugol' and at other enterprises. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 May 82 p 2] 6521

COMPETITION LEADERS--VORKUTA--The miners of the association Vorkutaugol' have dispatched 52 additional tons of fuel to customers on the account of pledges of the second year of the five-year plan. The leaders in the pre-Mayday competition are the collectives of the Vorgashorskaya, Severnaya and Vorkutinskaya mines. The miners of the third section of the Vorgashorskaya mine, which is managed by O. Bobrov, are now in front among the mining brigades. The average daily load at the face exceeds 3,000 tons of coking coal. The cutting brigade of Hero of Socialist Labor A. Sakharov is also shown an example of shock labor. The brigade cut an average of approximately 500 meters of excavations per month. The Vorkuta workers are producing 62,000 tons of fuel ahead of schedule in honor of the communist subbotnik of 17 April. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Apr 82 p 3] 6521

PRODUCTION AHEAD OF SCHEDULE--The brigade of winner of the State Prize of the Ukraine Ivan Mikhaylovich Lisovskiy assimilated the Donbass coal-mining complex in first place at the Voroshilovgradskaya mine No 1 of the production association Voroshilovgradugol'. This collective produces 1,800-1,900 tons of coal ahead of schedule per day. Since the beginning of the year the brigade of I. Lisovskiy has mined 28,000 tons of coal above the plan. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Apr 82 p 1] 6521

SHOCK LABOR--VOROSHILOVGRAD--The brigade of Hero of Socialist Labor G. Motsak from the mine imeni Kosmonavtov of the association Roven'kiantratsit has produced almost 60 tons of coal above the plan since the beginning of the year. The brigades of Heros of Socialist Labor A. Kolesnikov from the Molodogvardeyskaya mine of the association Krasnodonugol' and Ye. Zav'yalov from the mine imeni Il'ich of the association Stakhanovugol' are also noting each day of the watch in honor of the 60th anniversary of formation of the USSR with shock labor. The leading collectives have recorded 50 and 15,000 tons of coal, respectively, this year to the above-plan account. The entry-driving brigades of the mines of the oblast are equalling the collective headed by Hero of Socialist Labor I. Naumov from the mine Znamya kommunisma of the association Donbass-antratsit. Since the beginning of the year its brigade has driven an additional 120 meters of underground excavations above the plan. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 May 82 p 1] 6521

COAL SHIPMENTS--A shipment of coal mined by young miners of Shakhty, Gukovo, Krasnyy Sulin, Belaya Kalitva and Novoshakhtinsk above the plan was dispatched to the industrial enterprises. The Komsomol-youth brigades of winners of the Lenin Komsomol prize N. Fomin from the Yuzhnaya mine, V. Kurniov of the May-skaya mine and the collective of the brigade of A. Reshetnyak from the mine imeni 60-letiya Leninskiy Komsomol made the greatest contribution to the above-plan box. The young miners of the Donbass have pledged to produce 800,000 tons of coal above the plan during the year of the 19th Komsomol Congress and the 60th anniversary of formation of the USSR. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 6 May 82 p 1] 6521

OPEN-PIT MINING--CHITA--The labor history of yet another coal-mining enterprise of the Transbaykal--the Tataurovskiy cut--has begun. Just two years ago this was an almost impassable swamp. But now an electric power transmission line has been laid to the coal deposit and a production base has been created. All this was constructed by the collective of one of the oldest enterprises of Chita--the Vostochnaya mine. This mine, located within the city, has reliably and continuously supplied the electric power plants of Chita with inexpensive fuel for many decades. But the coal reserves at the Vostochnaya mine have now been depleted. The miners were commissioned to develop a new field--the Tataurovskaya. Within several months many families of miners will move to the new well-appointed village, which will grow alongside the open-pit mine. Overburden operations have begun at the Tataurovskiy cut. The capacity of the open-pit mine will be brought up to 1.5 million tons of fuel annually by the end of the five-year period. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Apr 82 p 1] 6521

SOCIALIST COMPETITION--KRASNOYARSK--The workers of the association Krasnoyarsk-ugol' have recorded a little less than 400,000 tons of coal to their account above the plan. The collectives of the largest open-pit mines Nazarovskiy and Borodinskiy in the Kansk-Achinsk fuel and energy complex, to whose account were recorded 9,670,000 tons of coal, are the confident leaders in the socialist competition. The miners developed and exceeded the established production capacities ahead of schedule. The crew of the rotary bucket excavator headed by winner of the USSR State Prize P. Cherpakov, who achieved the highest production in the sector, the brigade of rotary excavator complex headed by V. Mezhev and the crew of the walking overburden excavator headed by V. Vasil'yev and B. Eshke made the greatest contribution to this. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Apr 82 p 2] 6521

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CSO: 1822/181



## PIPELINES

### GAS PIPELINE CONSTRUCTION REPORT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Apr 82 p 2

[Article by V. Zotov: "'Blue Fuel' Trunklines"]

[Excerpts] Approximately 20,000 kilometers of trunk gas pipelines must be laid and 232 compressor stations must be constructed during the 11th Five-Year Plan.

A sharp change has occurred in distribution of reserves during the short history of development of the gas industry. Storehouses of the "blue fuel" in Stavropol'skiy Kray, Saratovskaya Oblast and in the Ukraine have never relinquished their leading role to those of Western Siberia. The discovered gigantic fields and reserves in Northern Tyumenskaya Oblast--Medvezh'ye, Urengoy, Yamburg, Zapolyarnoye, Komsomol'skoye and Gubkinskoye and also the fields of Vuktyl in the Komi ASSR and Orenburg in Turkmeniya and Uzbekistan required an essentially new approach to their development. The main difficulty is how to deliver the gas from the Far North to the Urals and to the central regions of the country. Thousands of kilometers of trunk pipelines had to be laid over sparsely inhabited or completely uninhabited territory and tens of compressor stations had to be constructed under difficult natural and climatic conditions.

To estimate the scale and complexity of the postulated task, one must take a look at least at the two previous five-year plans--the 9th and 10th. During this time 14,700 kilometers of gas pipelines 1,420 mm in diameter were constructed. But during this five-year plan alone pipelines of the same diameter with length of almost 1.5 times greater must be laid.

Let us name these most important "blue fuel" trunklines:

Urengoy-Ukhta-Gryazovets--1,440 km;

Urengoy-Punga-Petrosk--2,019 km;

Urengoy-Punga-Novopskov--3,570 km;

Urengoy-Pomary-Center (first run)--3,423 km;

Urengoy-Pomary-Center (second run)--3,384 km;

Urengoy-Pomary-Uzhgorod--4,650 km.

It is easy to note that each gas pipeline, except the first, approaches the BAM [Baykal-Amur Mainline Railroad] in its linear measurement. But the export gas pipeline even exceeds the construction project of the century. And one five-year plan is being allocated to develop the entire largest gas transport system. Not only enormous volumes of excavation work must be carried out, thousands of kilometers of pipe must be welded and many natural obstacles must be overcome, but qualitatively new trunklines must be developed. Gas will be transported under a pressure of more than 75 atmospheres for the first time over gas pipelines of this diameter.

Thus, the union Mintyazhstroy [Ministry of Heavy Construction] and Minpromstroy [Ministry of Industrial Construction] should construct 19 compressor stations each during the current five-year plan, USSR Minstroy [Ministry of Construction] should construct 17 and USSR Minenergo [Ministry of Power and Electrification] should construct 14. The organizations of Minenergo must also lay new and also increase the capacities of existing electric power transmission lines within compressed deadlines and must expand electric substations. Organizations of USSR Minmontazhspeystroy [Ministry of Installation and Special Construction Work] and USSR Minsvyaz' [Ministry of Communications] should perform large volumes of work as subcontractors.

Work on the line part of the second Urengoy-Petrovsk Gas pipeline was completed on the eve of 1982--three months earlier than the planned deadline. The trunk line has already begun operation. The first billion cubic meters of gas has been delivered through it. Compression stations, which should also be turned over before the end of this year, are also being constructed on a broad front.

Further developing the acceleration acquired in construction of the first two gas trunklines, the collectives of the contract organizations of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] and enterprises of Mingazprom [Ministry of the Gas Industry] adopted new high pledges: to put the Urengoy-Novopskov gas pipeline into operation 3-4 months earlier than the deadlines established by the plan.

Much has already been done. On 10 April 2,226 kilometers had been welded into the run and 1,665 kilometers had been laid and insulated. A more than 250-kilometer section of gas pipeline has been purged and prepared for testing. The collectives of the Soyuzgazpetsstroy [expansion unknown], Kuybyshevtruboprovodstroy [expansion unknown], Tatnefteprovodstroy [expansion unknown], Mosgazprovodstroy [Moscow Trust for Gas Pipeline Construction] and the Trans-Caucasian Administration of Pipeline Construction have distinguished themselves by laying at accelerated rates.

The leading collectives of the sector have emerged with the initiative of turning over the line part of their own sections to the Urengoy-Novopskov gas pipeline by the birthday of V. I. Lenin. A considerable part of the new trunk line will begin to be operated during the first six months of 1982. A task of exceptional importance has been posed to the builders and gas workers--bring the gas pipelines to full design capacity no later than 3-4 months after completion of work on the line part.

## Build Ahead of Schedule and Develop Ahead of Schedule

Gas pumping units of 16,000 and 25,000 kilowatts with full-pressure pumps will be used for the first time in the practice of the Soviet gas industry.

The most important factor of accelerated construction and development of the unique gas transport system is the progressiveness of the engineering and production decisions made. They are primarily directed toward reducing the estimated cost of facilities, of reducing operating expenses and of guaranteeing high operational reliability. Primary attention has been devoted to reducing the laboriousness of construction. Complex committees have considered in detail with excursion to the sites the versions of selecting the direction of the gas pipeline routes. As a result a decision was made to lay all of them from the Orenburg field to the center of the country in a unified production corridor, which guarantees mutual redundancy of the gas pipelines, reduction of the number of facilities of auxiliary production designation and combination of communications devices and electrochemical protection against corrosion. Moreover, laying the gas pipelines in a unified corridor permits one to approach development of the towns along the route on a new basis. Since their operating time is being considerably increased, they are being constructed on a higher comfort level. Good conditions are being created in these towns for recreation, medical service and physical culture and sports exercises.

The most radical changes have been introduced in the design of the compressor stations. Gas-pumping units with output of 16,000 and 25,000 kilowatts with full-pressure pumps will be primarily used for the first time in Soviet practice. The use of these machines compared to the traditional GTN-10 unit reduces by a factor of more than 2.5 the laboriousness of constructing the compressor stations and by more than a factor of 4 the need for acutely scarce fittings, thick-walled pipes and connecting parts. A total of 145 of these units will be installed at the compressor stations during the five-year plan.

Individual shelters of considerably smaller volume are being constructed instead of the two-story compressor stations now constructed. The design solutions of the stations and the entire complex of facilities of auxiliary production designation have been standardized on the basis of the maximum use of complete units, manufacture and installation of production equipment and construction of buildings from lightweight structures of maximum plant readiness.

One of the most important measures directed toward conversion to a qualitatively new level of construction is the delivery of complete prefabricated compressor stations with high degree of plant and installation readiness is being carried out by a unified general supplier.

It has been calculated that if the compressor stations and other facilities of production designation were constructed by the ordinary method, an additional 50,000 to 60,000 persons would be required.

The high level of industrialization of the planning decisions is reliably supported by a constant increase of the level of mechanization of operations. The total number of machines used in construction of facilities will exceed

30,000 units by the end of the five-year plan. Excavators with bucket capacity up to two cubic meters, rotary bucket excavators with productivity of 1,200 cubic meters per hour, heavy pipe-laying machines with capacity of 50 tons, Tyumen' swamp vehicles and various designations of installation cranes and other equipment are being delivered to the routes. Extensive work has been done in the sector to improve the organizational structure. Each formation is directed toward the final result. Reinforced production flows that operate by complex contracts have been created.

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CSO: 1822/179

## PIPELINES

### USSR OIL AND GAS MINISTER ON PIPELINE CONSTRUCTION

Kiev PRAVDA UKRAINY in Russian 28 Apr 82 p 3

[Article by B. Shcherbina, USSR Ministry of Construction of Oil and Gas Industry Enterprises: "Energy Arteries"]

[Excerpts] The rates of development of the oil-producing industry and especially of natural gas production are increasing during the 11th Five-Year Plan. New fields must be developed, five of the largest trunk gas pipelines from Western Siberia to the Center must be constructed and put into operation and the Urengoy-Uzhgorod export gas pipeline, over which it is planned to deliver gas to the European countries, must also be constructed. The routes of the trunk pipelines form their own type of "energy corridors."

A decisive role is being allocated to Tyumenskaya Oblast, especially to its northern regions. Nature creates a paradoxical situation--one must travel from the warm south to the north and Transarctic. And this means that both people, equipment and the trunklines under construction are subjected to the most serious tests under extreme situations. And under these conditions the Urengoy-Gryazovets-Moscow gas pipeline is being constructed ahead of schedule and will be introduced to design capacity the year it is completed. The second gas pipeline--along the Urengoy-Punga-Petrovsk route--is already transporting gas. Construction of the Urengoy-Uzhgorod export gas pipeline has begun. It is planned to construct a total of 61,000 kilometers of various trunk pipelines in our country during the 11th Five-Year Plan and counting the development of fields it is planned to construct approximately 80,000 kilometers. In other words, twice around the equator!

The scales of accelerated development of the gas industry and construction of the largest gas pipelines systems are great. The length of pipeline transport was doubled during the 9th and 10th Five-Year Plans alone and now exceeds 230,000 kilometers, while the carrying capacity has increased fourfold. A total of 50,000 kilometers of pipelines with pumping and compressor stations was constructed during the past five-year plan alone. Having become an independent sector, pipeline transport now provides approximately one-third of the freight traffic volume in the country and it will take on half the planned increase of the freight traffic volume during the 11th Five-Year Plan.

At the same time our sector is faced with a number of problems noted in the decree of the CPSU Central Committee. It was pointed out in this document

that one of the basic and decisive factors of the extensive and complex construction program under conditions of limited labor resources, planned for the 11th and 12th Five-Year Plans by Minneftegazstroy [Ministry of Construction for Petroleum and Gas Industry Enterprises] is acceleration of developments and extensive introduction of highly productive construction and transport technology and progressive methods of construction production and leading forms of organization of labor.

Institutions of the Ukrainian SSR Academy of Sciences have made a significant contribution to acceleration of the scientific and technical progress of our sector. Our ties are long and fruitful. Investigations conducted by institutes of the Ukrainian SSR Academy of Sciences contributed to organization of domestic production of large-diameter welded pipes, to development of the basic principles of welding operations in construction of trunk gas pipelines and to development of mechanized methods and equipment for welding and effective methods of quality control of pipelines and protection of them against corrosion.

Unique pipeline transport is a prestigious Soviet achievement that has no analog in the world. Judge for yourself: although the total length of the trunk pipelines in the United States is greater than ours, we transport more hydrocarbons by pipeline. The fact is that our scientists and producers have created powerful pipeline systems from large-diameter pipe with working pressure of 75 atmospheres. One of these pipelines carries more energy than all the hydroelectric power plants constructed on the Angara and Yenisey Rivers together!

Trunklines of pipe 1,420 mm in diameter now comprise only 11 percent of the total length of gas pipelines, but they transport more than 40 percent of the gas. Need one say how great the advantage is in time and in expenditures of metal and how high the efficiency of transportation is.

A total of 20,000 kilometers of pipelines of the largest diameter must be constructed during the 11th Five-Year Plan--twice as many of these trunklines as was constructed until now. And yet another detail: whereas the capacity of all the compressor stations on the country's gas pipelines comprised 18 million kilowatts by 1981, during the current five-year plan we must introduce compressor stations rated at more than 20 million kilowatts.

It is known that a thousand kilometers of pipeline is almost a million tons of metal, compressor stations with capacity on the level of the current Dneprovskaya GES and 50 million cubic meters of excavated and returned fill and re-cultivation of lands. But this is not only a matter of scale. Many questions arise.

One of the most timely problems is to convert to development of a new class of pipeline systems where the main role should be played by an increase of pressure--from the current 75 atmospheres to 100 and 120 atmospheres. Whereas 34-36 billion cubic meters of gas annually can be transported over today's large-diameter pipelines, the increased pressure will permit a one-third increase of this indicator.

We will begin laying the first 100-atmosphere pipelines by the end of the five-year plan.

Other solutions, including those with low-pressure transport of gas, are also possible.

It is important to reduce the flow of gas as a fuel for the self-needs of the gas pipelines. Extensive introduction of electric drives and an increase of the efficiency of gas pumping units may significantly assist the gas conservation. We hope for active assistance of the scientists of the Ukrainian SSR Academy of Sciences in solution of these problems.

The central problem for pipeline transport as for the entire technology is reliability. Taking the increased energy capacity of the pipelines and the multirun nature of systems and their long length into account, we are placing serious hopes on the results of the investigations of scientists--engineers, physicists, strength technicians, materials science specialists and other specialists.

The requirement of the longitudinal stability of gas pipelines is acutely felt when laying trunklines in the swampy and flooded territories of Western Siberia and the Arctic and also under permafrost conditions. Thermophysical and other research on cooling the transported gas are required.

Pipeline transport has entered a new phase of development. The difficulties will increase as one moves north and develops the Arctic and offshore fields. And new complex solutions are required in the field of metallurgy, machine building, welding and construction.

The value of improving the quality of pipes is high. We are now expanding the introduction of the highly efficient Sever-1 pipe-welding complex, developed by the Institute of Electric Arc Welding imeni Ye. O. Paton, Ukrainian SSR Academy of Sciences, in cooperation with sector organizations. This progressive technology of electric pressure contact welding has considerably increased the requirements on the quality of pipes delivered to the routes.

At the same time a search is under way for economically alloyed steels for large-diameter pipes. Much has also been done in this direction at institutes of the Ukrainian SSR Academy of Sciences. The original multi-layer designs of pipes, reinforced quasi-monolithic steels and some other developments suggested by the Ukrainian scientists and engineers are of great interest.

It is no secret that corrosion inflicts more losses on the national economy than any natural consequences. The best way out in pipeline management is timely insulation of pipes at the plants. We universally support the work of Ukrainian chemical scientists in protective materials and we are organizing output of these materials at one of the enterprises of our ministry.

We also include development of fully automated trunk systems (including oil and gas preparation installations) among the urgent matters. Besides various other factors, conservative thinking and fear of automation when psychological

losses circulate with discernible economic losses in production, alas, are also felt. The maintenance staff at each compressor station comprises 100-120 persons at the current level--this is far too many. It is understandable that conservation of human resources as a result of wide introduction of means of automation and telemechanics is of enormous significance under conditions of the current demographic situation. Moreover, reliability is enhanced and capacities are more fully utilized. But to increase the carrying capacity of the routes by only 1 percent means to produce in addition more than 4 billion cubic meters of gas.

The Institute of Cybernetics imeni V. M. Glushkov, Ukrainian SSR Academy of Sciences, is doing much for the needs of gas and oil transport and we hope that the developments of this collective will assist us.

We must solve many problems by using the scientists in transportation of oil and petroleum products over pipelines and also by using different solid materials, including coal and ores.

Yet another problem is we are going to the north for oil and gas and most of the machines, mechanisms and equipment that we have produced is made in the ordinary rather than the Arctic version. As a result there are enormous delays. The assistance of science is needed here.

That is why we are devoting great attention to development of various types of earth-moving, transport, installation, welding and other equipment. The All-Union Scientific Research Institute for Construction of Trunk Pipelines (VNIIST), the SKB [special design office] Gazostroy mashina and other organizations of our sector are in close contact with colleagues from the institutes of the Ukrainian SSR Academy of Sciences. And the Kiev branch of VNIIST, being under double subordination (the ministry and the Ukrainian SSR Academy of Sciences) serves as the "bridge" to reinforce the business ties.

Complete prefabricated construction also requires innovations. The future direction is conversion from individual modules of block elements to complex stations and installations of high unit capacity. As indicated by planning developments, these superblocs should weigh approximately 400-1,000 tons. How can they be transported under conditions of lack of roads of the Siberian and Arctic areas? We recall the interesting proposals of enthusiasts from the Kiev Public Design Office for Aerostations--in the field of aerostat transport, specifically of dirigibles. The time has come to implement these ideas and not only transport but production aerostat equipment must be developed.

The extensive social program that includes measures to improve the life and well-being of the builders should also be implemented, mobile housing complexes with cultural and service facilities for the workers under field conditions must be constructed and so on.

All these and many other problems were discussed at a joint meeting of the board of our ministry and the Presidium of the Ukrainian SSR Academy of Sciences. A decree was adopted which confirms the basic directions of joint work and the topic of research and applied developments, executors and deadlines.

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CSO: 1822/179



## PIPELINES

### KUYBYSHEVSKAYA OBLAST PIPELINE REPORT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 4 Apr 82 p 2

[Article by A. Vorob'yev: "Rapid Steps of Route"]

[Excerpts] The production flow of the Mosgazprovodstroy Trust [Moscow Trust for Gas Pipeline Construction] is now moving forward. Let us take a small interview directly on the route not far from Togliatti.

The chief of the insulation-laying column R. Davidyuk says:

"The route is complicated. There are more than 100 breaks--roads, underground sewer lines, ravines and rivers--on 85 kilometers. A total of 70 kilometers was insulated within three months. All the fellows are working with total effort, trying to fulfill their pledge of turning over the line part by 22 April."

"Our average step is a kilometer per shift, which is double the norm. Brigade leader V. Satarov and electric arc welders N. Kolontay and A. Savin show the example in labor. We are now completing the welding work begun in the middle of January."

This is the 2,263rd kilometer of the route. A small polyana lies before a pine grove. There are a fresh trench and six yellow pipe layers holding a black thread of pipe in their jaws. The machinery has been shut down for the lunch break. Buses come up right to the trench one after the other. The leaders of the socialist competition, representatives of the 12-thousand collective of builders are in them. They came here from Urengoy and Tyumen', Ufa and Kuybyshev, Togliatti and Syzran'--from the entire route in order to summarize the results of the first step of the "workers' relay race" and to refine their own pledges for the second year of the five-year plan. In the field car the deputy minister of construction of oil and gas industry enterprises G. N. Sudobin says:

"As is known, the six large gas pipelines from Siberia to the European USSR are the most important construction projects of the 11th Five-Year Plan. The first of them, the Urengoy-Moscow pipeline, was turned over ahead of schedule, in May of last year. Its design capacity has now been reached. The second run of the Urengoy-Petrovsk pipeline became operational in March of this year, two months earlier than the deadline. The first tens of millions of cubic

meters of gas have already been delivered over it. Construction of the third Urengoy-Novopskov trunkline stretching 3,341 kilometers is now proceeding ahead of schedule. More than 2,000 cubic meters of pipes have already been welded and insulation-laying work has been completed on a length of 1,420 kilometers. The daily pace of the pipe layers is 30 or more kilometers. We hope that the rates achieved in construction of the Petrov run be transferred to construction of the new facility. This in itself will help to gain a time advantage and to begin construction of the Urengoy-Uzhgorod export pipeline earlier.

The Kuybyshebtрубopроводstroy Trust [expansion unknown] has called for an initiative to complete work on its own section by the 112th anniversary of V. I. Lenin's birth. This beginning found a response in many subdivisions of different construction regions. And now the builders are unanimously adopting their own pledge: Complete the line work on the entire route in December of this year, by the 60th anniversary of formation of the USSR rather than in the second quarter of 1983 as provided by the directive schedule.

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## PIPELINES

### BRIEFS

**STEEL FOOTINGS**--The Siborggazstroy Firm [expansion unknown] of Glavtyumenneftegazstroy [Main Tyumen' Administration for the Construction of Petroleum and Gas Industry Enterprises] has developed footings of a new design for oil and gas pumping units of pumping and compressor stations. The traditional version of footings under these structures were large reinforced concrete slabs resting on tens of driven pilings of 8-10 meters each. It is natural that to construct them under the complex engineering and geological and severe climatic conditions of Western Siberia is not quite so simple. Moreover, delivery of each ton of freight is related to many difficulties. The new design is extremely simple. This is a comparatively lightweight steel frame of longitudinal and transverse beams which rests on tin driven pilings. Labor expenditures for manufacture and installation are reduced by more than one-half and the construction period is reduced by 20-30 percent. The total saving, depending on the type of machine, is from 400,000 to 1.3 million rubles at each compressor station. The footings of new design have broadly entered the practice of construction of pumping and compressor stations in Western Siberia. They have given a good account of themselves for use in the entire Soviet Union. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 May 82 p 2] 6521

**GAS PIPELINE CONSTRUCTION**--VYSOKAYA GORA, Tatarskaya ASSR--The rack for welding operations was constructed near the village of Biryuli, Vysokogorskiy Rayon, Tatarskaya ASSR. The first runs of large-diameter pipe for laying the Urengoy-Uzhgorod gas pipeline have been welded here on one of the sections of the Tatnefteprovodstroy Trust [expansion unknown]. The collective of the trust has laid more than 16,000 kilometers of gas and oil pipelines and constructed 38 compressor stations during 29 years of its work. There are 170 kilometers of the Perm'-Al'met'yevsk trunk oil pipeline on its account. The Urengoy-Petrovsk gas pipeline, 270 kilometers of which was also constructed by the pipe layers from Tatariya, is in the testing stage. And a new difficult, but honorary task must now be carried out--lay 230 kilometers of a giant underground trunk line to the western borders of the country. The section of route entrusted to Tatnefteprovodstroy lies from Vyatka to the Volga River through Kirovskaya Oblast and the Tatarskaya and Mariyskaya ASSR. Preparatory work is being organized here, equipment is being brought in and living towns are being created. More than 10 kilometers of large-diameter pipe has already been delivered to the route. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Apr 82 p 1] 6521

PRESS COMPETITION--To publicize the creative activity of Soviet journalists in reporting on the course of construction of the Trans-Siberian trunk gas pipelines, the board of the USSR Union of Journalists, Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] and Mingazprom [Ministry of the Gas Industry] are announcing a competition for best reporting of this topic in the press and in radio and television broadcasts. The winners of the competition have been established: three prizes of 600 rubles each for republic and oblast newspapers and committees for radio broadcasting and television, three prizes of 400 rubles each for municipal, rayon and combined multirun newspapers, five prizes of 300 rubles each for journalists of central, oblast, municipal and rayon newspapers, All-Union radio and central television, local editorial boards of radio broadcasting and television that have prepared the best summaries, display articles, reporting and correspondence and two prizes of 250 rubles each for the best photoreporting. Organizations of mass information and propaganda that participate actively in publicizing the course of work on the most important construction projects of the gas industry are awarded with honorary certificates of the USSR Union of Journalists. Materials to apply for the prizes are presented to the board of the USSR Union of Journalists by republic, kray and oblast organizations of the Union of Journalists, to the editorial boards of the central newspapers and journals, to the USSR State Television and Radio, TASS, an APN [Novosti Press Agency] prior to 1 April 1983. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 May 82 p 4] 6521

COOLING UNIT FOR GAS PIPELINE--SUMY--Delivery of blue fuel from the Arctic regions of the country is a complex engineering problem. The gas is heated during pumping, which leads to melting of the permafrost and settling of the pipelines. A unique cooling unit developed by collectives of a number of institutes and the KB [design office] of Minkhimmash [Ministry of Chemical Machine Building] and manufactured at the Sumy Machine Building Association imeni Frunze, makes it possible to eliminate these phenomena. The operating principle of this machine is similar to a domestic refrigerator. Only instead of a freezer this unit has an evaporator--a structure with the height of a five-story building, where the transported gas is cooled to the necessary temperature by a propane-butane mixture. And it is circulated by the turbocompressor unit operating from an aviation type engine. The saving from using the installation, already delivered to the Urengoy experimental industrial gas cooling station, will comprise almost 1.5 million rubles annually. The collective of the Sumy Machine Building Association imeni M. V. Frunze is preparing to organize serial output of this equipment during the current five-year plan, so necessary for transportation of the blue fuel over the superlarge trunk gas pipelines. [Text] [Moscow IZVESTIYA in Russian 18 Apr 82 p 3] 6521

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GENERAL

#### JOINT 'CEMA' MEASURES IN ENERGY FIELD OUTLINED

Kishinev SOVETSKAYA MOLDAVIA in Russian 14 Apr 82 p 3

[Article by V. Petrunya, TASS commentator: "The Power of Integration"]

[Text] The collaboration of CEMA member countries in the areas of energy, fuel and raw materials.

The development of modern economies has posed the problem of providing them with energy for some of the most important national economic tasks. According to the experts' forecasts, the demand for energy in the countries that belong to the Council for Economic Mutual Assistance will grow about 2½-fold by 1990.

On the other hand, expenditures for the recovery and transporting of fuel and raw materials, the main supplier of which for the socialist countries is the Soviet Union, are rising rapidly. This is caused primarily by the fact that the extraction of these materials is migrating to remote, poorly populated regions. Many of the new fields are being developed where the geology is unfavorable. It is no accident that during the last five-year plan, for example, costs for recovering a ton of crude oil in the USSR rose more than 2-fold in comparison with the period prior to 1972. Costs are also increasing during the current five-year plan.

Therefore, special importance is attached to a joining of forces of the fraternal states in this area. It is being developed on the basis of a long-term specific-purpose program for collaboration (DTsPS). This is one of five programs that cover the most important branches of material production.

This form of joint planning activity determines the coordinated strategy for collaboration over the long term. It calls for the collective use of overall production capabilities and intensification in specialization and in the use of cooperative arrangements. Specific-purpose programs are aimed at meeting the countries' economically justified needs for energy, fuel, raw materials, foodstuffs, means for production and technology with common efforts. In other words, these programs are subordinated to the creation of a firm base for long-term economic development.

One of the most important stages in the realization of DTsPS's is the concluding of general agreements and other contracts based upon them. The agreement about multi-lateral international specialization and the use of cooperative arrangements for the production and mutual deliveries of equipment for nuclear-power stations during the period 1981-1990 should be one of the major agreements.

What is its significance? Primarily, the accelerated development of nuclear power will fulfill the task of meeting the rapidly rising requirements of CEMA-member countries for electric power. This is a most important area of the fuel-and-power portion of the program. It is planned to build nuclear power stations with a total capacity of about 37 million kw in Europe's CEMA countries. This means that each year 70-75 million tons of standard fuel equivalent can be saved. Let us note, by way of comparison, that such a saving is equal to introducing four gas pipelines like the Soyuz into operation.

The long term is taking on realistic outlines. The Khmel'nitskaya AES, of 4 million kw capacity, is being erected in our land. It is being built with the joint forces of Hungary, Poland, Czechoslovakia and the Soviet Union. When the station reaches design capacity, half of its energy will be sent to the Hungarian People's Republic, the Polish People's Republic and the Czechoslovak Socialist Republic. The specific amount that will go to each country will be determined by its share in participation in the construction work. This is one of the principles of our collaboration.

Construction of the station and power transmission lines has required wide-scale use of cooperative arrangements for producing equipment and apparatus. The AES will be equipped with water-moderated water-cooled reactors, each of 1,000-megawatt capacity. This huge unit capacity of the power units is of no small economic advantage. Use of it is a direct path to reducing capital investment for construction.

The Khmel'nitskaya AES is one of 25 large industrial facilities whose erection is called for by the specific-purpose program (13 of them on USSR territory). The DTsPS's include the construction of a number of pumped-storage electric-power stations. The first of these are the Lakatnik in Bulgaria and the Predika Losek in Hungary. Such stations are effective within joint power systems, for they serve as an emergency and dumping reserve.

An important energy reserve is expansion of the recovery and improvement in the use of solid fuels, including low-calorie fuel--brown coal, lignite and shale. For purposes of a more productive solution to this problem, electric-power stations will be equipped with large automated power units. Their capacity will be 300-500 megawatts.

As is known, during the current five-year plan the fraternal socialist countries will emphasize intensive methods of economic work. There are still many unused reserves here. Take oil refining alone. The degree of it, or, as the specialists say, its intensity right now has been determined to be about 45-50 percent in most CEMA countries. It turns out that at least half of the most valuable raw material in the form of mazut is being used as steam fuel. Specialists consider the possibility of bringing the intensity of refining up to 65-70 percent to be completely realistic. The real return from this is many millions of tons of fuel and lubricants per year.

That is why it is planned to deliver, within the CEMA framework, prior to 1990, progressive types of outfitted equipment, by means of which it will be possible to refine almost 190 million tons of crude per year. This task is being fulfilled also on the basis of specialization and the use of cooperative production arrangements.

Maps of the CEMA countries' new construction projects are increasingly displaying facilities that will be called upon to fulfill completely the task of meeting their requirements for iron-containing raw materials and metals. Thus, two mining and beneficiating combines and one ore mine are being built in the USSR: these enterprises will enable 17 million tons of raw material (expressed in terms of metal) to be produced annually. A broad program for developing nonferrous metallurgy is being carried out in Cuba. Its full realization will permit, it is anticipated, the CEMA member countries' long-term requirements for nickel to be completely satisfied. And the collaboration of interested governments in erecting on USSR territory two specialized enterprises--a plant and a combine--will enable the production of bleached sulfate paper and of newsprint to be increased by hundreds of thousands of tons per year.

As the 26th CPSU Congress noted, "integration increases strength." One of the concrete expressions of this is the execution of long-term specific-purpose programs for collaboration in the areas of energy, fuels and raw materials.

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GENERAL

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# FUTURE DEVELOPMENT OF PETROLEUM INDUSTRY IN USSR

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 4, Apr 82 pp 3-8

[Article by N. A. Mal'tsev, USSR minister of the petroleum industry: "Work Efficiently and With Quality"]

[Excerpts] The rates of development of the petroleum industry correspond fully to the "Basic directions for the economic and social development of the USSR for 1981-1985 and for the period up to 1990." In 1981 1.6 million tons of petroleum and gas condensate above the plan was produced in the sector, almost 48 billion m<sup>3</sup> of gas was produced, including 32 billion m<sup>3</sup> of oil gas, which is 2 billion m<sup>3</sup> greater than in 1980. The level of gas utilization was brought up to 72.4 percent compared to 68.6 percent in 1980.

A further increase of the volumes of drilling operations was achieved--21.6 million meters of test and exploration wells were drilled, which is 20 percent greater than 1980. The volumes of drilling in Western Siberia were especially increased (by 32.3 percent).

A total of 7.2 billion rubles of capital investments was assimilated, including 2.3 billion rubles for construction and installation work (SMR). The plan of construction and installation work by the industry's own construction organizations was overfulfilled.

Crucial tasks were posed to the workers of the petroleum industry in the five-year plan for economic and social development of the USSR for 1981-1985 and also in the planned indicators for 1982, approved by the November (1981) Plenum of the CPSU Central Committee and confirmed by the sixth session of the USSR Supreme Soviet, 10th convocation. It is planned to bring petroleum and gas condensate production in the country up to 614 million tons in 1982 and up to 630 million tons in 1985. Almost 131 million meters of exploration and test wells must be drilled during the 11th Five-Year Plan, which is twofold greater than during the 10th Five-Year Plan.

A task of enormous state importance is further development of the Western Siberian oil and gas complex. Oil and gas condensate production during the five-year period should increase by 82 million tons. To do this, it is planned to drill approximately 77 million meters of wells. The watch-expeditionary method should continue to be developed and improved. A total of 28 million meters must be drilled by this method in Western Siberia.



Crucial work remains in accelerated development of the petroleum industry in Western Kazakhstan and in the northern Komi ASSR.

The November (1981) Plenum of the CPSU Central Committee emphasized the need for fundamental improvement of organizing activity in all directions of the work of enterprises, production of the maximum volume of products with already created production capacities, economical and efficient use of material and technical, fuel and energy, labor and financial resources. The deterioration of mining and geological conditions for exploitation of oilfields should be countered by work on better use of production funds, realization of the achievements of scientific and technical progress and mobilization of the reserves of the sector.

Managers of all administration levels should consider it their most important duty to fulfill the task "economics should be economical," posed by the 26th CPSU Congress. Our entire economic mechanism should be aimed toward solving it and all administrative, economic and moral levers and stimuli should be used.

Complex specific programs directed toward search and implementation of the most effective methods of development of the petroleum industry and fulfillment and overfulfillment of the planned tasks for the five-year plan and for 1982 have been worked out by Minnefteprom [Ministry of the Petroleum Industry] to implement the decisions of the 26th Party Congress and the November (1981) Plenum of the CPSU Central Committee.

These programs combine the activity of production, scientific research and planning organizations of the petroleum industry and its related sectors. The programs encompass problems of increasing the level of utilization of the petroleum resources of the interior, improving the techniques and technology of oil and gas production, use of capacities and basic funds, accelerated development and improvement of the technical and economic indicators of drilling operations, strengthening of the raw material base of the sector, improvement of sector planning and increasing the effectiveness of the economic mechanism and improving the management system. In this case the programs are aimed toward achieving the maximum final result.

Work to improve exploitation of oil fields acquires primary significance in this case.

The reliability of taking into account the raw material base, total conformity of oil and gas reserves numbered in the balance of associations actually existing in the interior and strict adherence of the technological documents compiled on this basis for exploitation of fields is the basis for reliable and rhythmic operation of oil-producing enterprises.

Stable fulfillment of the oil production plans is guaranteed there where work on extraction of oil reserves is organized on a scientific basis and where strict fulfillment of the planned exploitation technology has become the norm.

An example of this work are the Bashneft' [Bashkir Petroleum Association], Tatneft' [Tatar Petroleum Association], Udmurtneft' [Udmurtia Petroleum

Association] and Kuybyshevneft' [Kuybyshev Petroleum Association]. Unfortunately, this cannot be said about Glavtyumenneftegaz [Tyumen' Main Administration of Oil and Gas], Stavropol'neftegaz [Stavropol' Petroleum and Gas Association], Komineft' [Komi Petroleum Association] and Turkmenneft' [Turkmen' Petroleum Association].

Improving the state of exploitation requires strict monitoring of it, greater encompassing of pools by flooding to maintain bed pressure and bringing reserves into active operation not encompassed by the expulsion process. Moreover, methods of flooding can no longer guarantee a new qualitative jump in oil production and especially in an increase of the oil yield of beds. One of the most important problems of scientific and technical progress in the sector is to expand the use of new methods of acting on oil beds and primarily of chemical and thermal methods.

A considerable volume of work has now been conducted on testing and improving the methods of increasing the oil yield. At the same time there are many deficiencies. The permitted lag in development of experimental and commercial fields and in construction and putting all the required facilities into operation must be decisively overcome.

New methods of increasing the oil yield of beds by the mechanism of production processes is considerably more complicated than flooding. The problem of training qualified personnel capable of managing such complex processes and of working with new hardware arises in this regard.

The main means that guarantees efficient exploitation of fields and fulfillment of the tasks in oil production is the stock of wells. This is the basic and most active part of the production funds which must be skillfully used.

Bashneft', Tatneft', Ukrneft' [Ukrainian Petroleum Association] and some other associations have achieved good results in this regard. However, the level of well utilization is below the sector indicators in Azneft' [Azerbaijan Petroleum Association], Komineft', Permneft' [Perm' Petroleum Association], Turkmenneft' and at Glavtyumenneftegaz.

A qualitative jump in an increase of the operating period between repairs is required under conditions of a sharply growing stock of wells (especially those operated by the mechanized method). There is positive experience at NGDU [Oil and Gas Administration] Arlanneft' [Arlan Petroleum Association] of the Bashneft' Association. The stock of wells here has been attached to brigades for routine repair and payment of their labor has been organized in such a manner that they have begun to answer for the increase of the period between repairs and a reduction of the number of idle wells rather than for the number of repairs and acceleration of them. This experience deserves universal dissemination.

Broad chemization of production processes has important significance to reduce the volume of repair work and to increase the operating reliability of oilfield equipment, pipelines and other facilities.

Measures have been adopted in the sector during the past few years to strengthen the weakest link in oil production. Shops (fields) and brigades for oil and gas production have been created which have been entrusted with the task of guaranteeing uninterrupted operation of the entire stock of wells. However, they are not involved in all regions in strengthening these most important subdivisions. In some cases the brigades are made up of several persons who maintain only 5-10 wells. The capabilities of these brigades are limited and they cannot be given complex tasks. Large brigades that maintain 80-100 wells must be created and then their role and skills will be very high.

One of the most important economic levers in developing the initiative of oil production brigades is converting them to piecework payment of labor with strict individual accounting of the oil produced. The managers of some associations are slowly organizing universal accounting of oil production by brigades and conversion of them to piecework payment. As a result approximately 400 of 1,200 brigades has been converted and it is planned to convert 600 in 1982, but the deadlines for the remaining brigades are being unjustifiably extended. This situation cannot be tolerated.

Introduction of the progressive gas lift method of well operation, which has a high period between repairs and lower laboriousness of maintenance and repair, occupies a special position in the increase of labor productivity. This method should find broad application in the fields of Western Siberia, where mass drilling of clusters of sloping wells is being carried out in difficultly accessible regions and in regions with special operating conditions (great depths, high gas factors and so on). However, construction of gas lift complexes at the Samotlor and Fedorov fields lags behind the planned rates. The lag of 1981 must be made up in 1982. The Komineft' Association should universally accelerate work in design and construction of gas lift complexes at the Vozeyskoye and Usinskoye fields.

There are large reserves in more complete utilization of oil gas resources and the use of refining capacities. However, use of the unstable gasoline of gas refining plants--a most valuable raw material for the petrochemical industry--remains a problem. Because of the lag of deadlines in starting up the Tobol'sk petrochemical combine, the Southern Balyk-Tobol'sk product pipeline is essentially not being used. All the problems must be solved in a complex manner, which guarantees balanced development of the capacities of the gas facility and specifically, acceleration of the construction of the product pipeline for pumping unstable gasoline to the Urals and Volga regions.

Problems of total collection and delivery of the final separation stages for gas refining must be solved in the assimilated oil- and gas-producing regions of the Urals-Volga area, the Northern Caucasus and some others, where the level of oil gas utilization comprises 94-96 percent. A special program must be implemented in Western Kazakhstan to refine hydrogen sulfide-containing gas with production of elementary sulphur at Zhonazhol, Tengiz and other fields.

One of the key problems in developing the petroleum industry during the 11th Five-Year Plan is to guarantee a further sharp increase of the volumes of drilling operations. It should be accomplished in this case mainly by

intensifying the operations and fundamental improvement of the technical and economic indicators on the basis of fundamental technical re-equipping and further improvement of the technology and organization of drilling operations rather than by increasing the number of brigades.

A special program has been developed for the future that envisions tasks to the related sectors in organization of production of progressive drilling technology and materials. However, one cannot count on the influx of new equipment and one's own reserves cannot be utilized. The rates of test drilling should be increased by 8.6 percent and the rates of exploration drilling should be increased by 5.5 percent in 1982 and they should be increased 1.6- and 1.3-fold during the five-year plan. Achievement of these positions is related primarily to the use of the most valuable work experience of the leading collectives.

It should be said that there are efficiently operating brigades in all oil regions, but achievement of high results by specific production collectives is of special importance. In this regard the work of the Surgut UBR [Administration of Drilling Operations] No 2, which is supervised by Hero of Socialist Labor G. M. Levin, deserves great attention. The average drilling per brigade reached 84,000 meters in 1981.

The Menzelinsk and Ivano-Frankovsk UBR, working by the watch-expeditionary method, achieved average sinking of approximately 50,000 meters/year per brigade, whereas there are also brigades with sinking of 30-35,000 meters/year in many drilling organizations of Western Siberia. These facts have also been noted in other regions in drilling, production and other spheres of activity.

Introduction of the indirect order for construction of wells that combines the efforts of all sections participating in this process--from the builders and installers to oil production brigades that accept the wells--opens up considerable possibilities.

An increase of the volumes of drilling operations should invariably be accompanied by an increase of their quality. We need high-quality wells that produce oil rather than meters of sinking. This is primarily true of the drillers of Western Siberia. In 1981 180 low-quality drilled wells were repaired here and turned over for operation. The Surgutneftegaz [Surgut Oil and Gas Association] and Yuganskneftegaz [Yugansk Oil and Gas Association] did considerable work but on the whole the drillers of Western Siberia did not fulfill the task for 1981 posed to them on putting all wells that require repair and insulation work into operation. The year 1982 should become the final year in implementing the planned program to eliminate emergency wells.

The drilling organizations of Embanefit' [Emba Petroleum Association] and Aktyubinskneft' [Aktyubinsk Petroleum Association] and the subcontractors from Nizhnevolzhskneft' [Nizhnevolzhsk Petroleum Association] and Saratovneftgaz [Saratov Oil and Gas Association] are faced with crucial tasks in fulfilling the program of intensifying geological prospecting operations and development of the oil and gas industry of Western Kazakhstan. They must fulfill a complex of measures to assimilate the techniques and technology of drilling wells on subsalt deposits with abnormally high bed pressures and high hydrogen sulfide and carbon dioxide content.

One of the basic tasks in guaranteeing further effective development of the petroleum industry is to fulfill the program of universal expansion of the raw material base of the sector. During the current five-year plan, the prospecting organizations of Minnefteprom must increase the efficiency of geological prospecting work by 36 percent compared to the past five-year plan. Based on the complex plans compiled for large regions, a specific program has been worked out for increasing the efficiency of geological prospecting operations; therefore, the task of the managers of associations and drilling and geophysical enterprises is to concentrate their forces and funds on more promising areas. They must see to it that not a single exploration well is a dry hole in structures prepared by geophysical methods. Serious requirements on high-quality sinking of deep exploration wells and timely analysis of the productivity of future structures are also placed on drillers, especially in Gruzneft' [Georgian Petroleum Association] and Azneft'.

The decisions of the 26th CPSU Congress on development of the petroleum industry posed the most important national economic task--creation of a new raw material base in Western Kazakhstan. The primary thing here is to carry out accelerated exploration and analysis of the commercial oil reserves of the Tengiz field.

Much remains to be done in development of geological prospecting operations in Western Siberia, Turkmeniya and other regions. Experience shows that the success of exploration operations is largely determined by the attitude of managers toward them and primarily by the attitude of general directors of the associations. A positive example may be the activity of managers of the Bashneft', Grozneft' [Groznyy Petroleum Association], Ukrneft' and Kuybyshevneft', who are constantly involved in this problem. As a result the plans for increasing the oil reserves are being fulfilled in these regions and rhythmic production of oil is being guaranteed.

One of the decisive conditions for stable operation of the sector during the current five-year plan is capital construction. It was pointed out in the speech of Comrade L. I. Brezhnev at the November (1981) Plenum of the CPSU Central Committee that the distinguishing feature of the 11th Five-Year Plan is a significant increase of putting basic funds into operation with lower growth of capital investments. These instructions are the basis of the plan of Minnefteprom for 1981-1985. Compared to the 10th Five-Year Plan, an 80 percent increase of basic funds is planned with an increase of capital investments by 63 percent. To do this, a thrifty and economical approach toward the use of the allocated limits and high organization in work to put production capacities into operation are extremely necessary.

At the same time the enterprises, associations and planning institutes should direct their efforts toward more complete utilization of existing capacities on the basis of their reconstruction, expansion and technical re-equipping.

Special control should be established over the construction of facilities erected by using sets of imported equipment. A clear complex plan is required for them, beginning from making the decision on design and construction using imported equipment and ending with the delivery schedule and turning the equipment over for installation.

Highway construction is of special significance under conditions of Western Siberia and Western Kazakhstan. Highly efficient use of equipment and labor and material resources are impossible without dependable, year-round functioning highways, so as to put the fields into exploitation on an accelerated basis. At the same time technical inspection of the construction and correct operation of highways must be intensified. By expending enormous funds, we should produce roads of the necessary quality and should guarantee prolonged operation of them. Much depends on the highway operating service of the associations.

A task of greater socioeconomic importance will as before be construction of housing and cultural and service facilities. Because of the important attention and concern of the CPSU Central Committee, these facilities began to be constructed more rapidly in 1981. Thus, the volume of construction and installation work on housing construction was overfulfilled for the first time at Glavtyumenneftegaz and 653,000 m<sup>2</sup> of housing was turned over for operation, which is 1.5-fold greater than in 1980. However, the plans of nonproduction construction are still not being fulfilled in many regions. The managers of associations and enterprises should themselves constantly monitor the course of construction of housing and communal-service and social and cultural facilities. A complex approach should be adhered to here--housing, kindergartens and children's institutions and social and cultural facilities should be introduced on time with development of production. Only in this case will favorable conditions be created for the workers.

The volumes of construction through the efforts of their own construction organizations will increase sharply (by almost 30 percent) during the 11th Five-Year Plan, including those in Western Siberia and Kazakhstan. Thus, it is planned to construct more than 1.5 million m<sup>2</sup> of housing and many social and service facilities. In this case the increase in the volumes of construction should be guaranteed mainly by increasing labor productivity.

Pipeline transport must be developed with a further increase of oil production, especially in regions of Western Siberia. It is planned to construct 16 MPS [oil pumping station] on the Surgut-Polotsk oil pipeline, of which 11 will be constructed in 1982. Construction of the Pavlodar-Chimkent and Perm'-Al'met'yevsk pipelines is to be completed in 1982 and construction of the Kholmogory-Kuznetsk oil pipeline is to begin with introduction of the Kholmogory-Perm' section in 1984.

The administrations of mainline oil pipelines should increase with even greater energy and initiative the functional reliability of pipelines. It is especially important to intensify monitoring the quality of their construction, to accelerate reconstruction and capital repair, to increase the quality of their maintenance and to expand work in complex automation.

The planned complex of measures to reduce oil losses and to improve accounting of it must be completed in 1982.

Success in solving the problems of the sector is determined to a considerable degree by the work of repair, transport and supply services and the enterprises

for producing machinery and construction products and special materials. The managers of these enterprises and services should correctly see their role of recognizing the high responsibility in solution of problems posed to the petroleum industry and should do everything necessary to achieve high final sector results. For example, as a whole the VPO [All-Union Production Association] Soyuzneftemashremont is fulfilling the plan, but the 1981 plan has not been fulfilled for the most important nomenclature and specifically in production of spare parts and capital repair of submersible electric motors at the Bugul'ma RETO [expansion unknown] plant. This situation is intolerable. The work should be organized so as to completely guarantee the enterprises of the sector with the necessary spare parts. This is the primary task of the Soyuzneftemashremont. Together with increasing the production of spare parts, their stability should be increased. This method is the most effective since it requires fewer resources not only in production but in operation of the equipment as well.

The 26th Party Congress and the November (1981) Plenum of the CPSU Central Committee turned special attention on the need to guarantee the strictest conditions of conservation and efficient use of everything that sectors of the national economy deliver. The task of each manager is to achieve fulfillment of the plans with the most efficient and effective utilization of allocated financial and material and technical resources. One should begin with fundamental improvement of accounting, storage and utilization of equipment and materials. A great deal of work has already been carried out in the sector and a pilot procedure has been designated in the Kuybyshevneft', Grozneft', Bashneftemashremont and other associations. However, as shown by checks, some associations are still displaying wastefulness in organization of storage of material valuables (for example, at Glavtyumenneftegaz and its associations).

Any cases of manifestation of mismanagement and wastefulness must be intercepted immediately and any initiative in conservation and thriftiness must be supported and specific decisions must be adopted. Moreover, the managers should turn attention toward the state of affairs with reserves of uninstalled and surplus equipment, especially that purchased by import. The measures adopted in 1981 made it possible to reduce somewhat the residue of this equipment but one cannot rest on one's laurels. Work must be waged constantly to redistribute the material resources and equipment among associations.

The role of efficient use of labor resources was especially emphasized at the November (1981) Plenum of the CPSU Central Committee. The 26th Party Congress posed the task to the petroleum industry for the five-year plan of reducing labor expenditures by 15-18 percent in maintenance of a single well. Labor productivity must be constantly increased and labor expenditures on maintenance of facilities must be reduced to fulfill it. In this regard fulfillment of a specific program on conservation of labor resources must be provided and all planned measures to mechanize and automate production processes, to reduce the volumes of manual labor, to improve organization of labor and production, to combine occupations, to increase the qualifications of workers and extensive dissemination of leading experience and brigade forms of organization of labor must be implemented.

Constant work was carried out in the sector to improve the use of labor resources in brigades, shops and at main production enterprises, but little attention was given to organization of the labor of workers of maintenance and auxiliary plants and control equipment operators.

Abolishment of surplus sections and subdivisions, consolidation of organizations, improvement of the operation of management apparatus and reduction of the number of personnel are of important state significance. And the task of the managers of associations and organizations of the sector is to rapidly and correctly solve these problems.

The main task of the 11th Five-Year Plan is to guarantee further growth of the standard of living of the workers. A complex program for social development of labor collectives has been worked out in the sector. It includes many important problems directed toward creation of a normal sociopsychological situation in the collectives. Development of housing and cultural and service construction, solution of problems of supply with provisions and consumer goods, improving the protection of health and medical service, raising the qualifications of personnel, their educational level and skills and much more are envisioned, which is related to the everyday life and work of workers. The activity of all collectives of the sector should be aimed toward implementation of the plant program.

The provisions task was named as the primary task at the November (1981) Plenum of the CPSU Central Committee. All the sectors, including the petroleum sector, should make their contribution to solving it.

A developed system of workers' supply, public catering, sovkhoses and auxiliary farms is active in the sector. A total of seven new sovkhoses and seven auxiliary farms were created in 1979-1981 alone. There are now 47 sovkhoses and auxiliary farms in the sector. The sovkhoses of the Bashneft', Tomskneft' [Tomsk Petroleum Association], Surgutneftegaz and other associations are coping successfully with the production plans of agricultural products.

There is still much to be done in this important matter. The managers of associations, enterprises and organizations of the sector should assist the URS in construction and technical equipping of the facilities and guarantee of them with housing, cultural and service and children's institutions.

An important social task is to create healthy and safe working conditions at each jobsite. Production injuries in the sector were reduced as a result of the completed work. However, injuries increased somewhat in the Azneft', Mangyshlakneft' [Mangyshlak Petroleum Association] and Urayneftegaz [Uray Oil and Gas Association] associations, which is absolutely impermissible and requires the serious attention of the managers of these associations.

The results of the November (1981) Plenum of the CPSU Central Committee and the speech of the General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev at the Plenum were a powerful impetus to increasing the labor activity of oil workers and generation of new initiatives directed toward fulfillment and overfulfillment of the planned tasks of 1982.



The collective of the Yuganskneftegaz Association emerged as the initiator of a socialist competition in the sector for 1982 to strengthen the positions achieved and to create a reliable base to implement the decisions of the 26th CPSU Congress.

The workers of the sector adopted the socialist pledges of producing 1.7 million tons of oil and gas condensate and 150 million m<sup>3</sup> of gas above the state plan for 1982 on the basis of rhythmic operation of all enterprises and bringing internal reserves into action.

The task of all collectives is to apply their own efforts, knowledge and rich experience to see that the 60th anniversary of formation of USSR is celebrated with new labor victories in development of the fuel and energy complex of the country and the raw material base of the petrochemical industry and to complete 1982 successfully.

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